SEMMES
ATTORNEYS AT LAW

Providing Legal Services...
Since 1887

SEMMES, BOWEN & SEMMES
A PROFESSIONAL CORPORATION

410.539.5040
www.semmes.com

Robert E. Scott, Jr.
Principal

Suite 1400
25 South Charles Street
Baltimore, Maryland 21201

410.576.4725
410.539.5223 Fax
rscott@semmes.com

October 22, 2014

Ms. Bonnie Hriczko
Removal Action Branch
U.S. Environmental Protection Agency, Region II
2890 Woodbridge Avenue, MS-211
Edison, New Jersey 08837

RE: Request for Information Pursuant to Section 104 of CERCLA
Superior Barrel and Drum Site, Elk, Gloucester County, New Jersey

Dear Ms. Hriczko:

I am enclosing with this letter a copy of the R.H. Sheppard Co., Inc.'s response to the EPA's request for information. If you have any questions concerning the enclosed, please do not hesitate to let me know.

Very truly yours,

Robert E. Scott, Jr.

RES:lsm
Enclosures
cc: William Tucker, Esq.
Office of Regional Counsel

489737

R.H. Sheppard Co., Inc.'s Response to EPA's Request for Information Pursuant to Section 104 of CERCLA

Superior Barrel and Drum Site, Elk, Gloucester County, New Jersey

1. a. State the correct legal name of the Company

R.H. Sheppard Co., Inc.

b. Identify the legal status of the Company (corporation, partnership, specify if other) and the state in which the Company was organized.

Corporation - Pennsylvania

c. State the names and addresses of the President, Chairman of the Board and Chief Executive Officer of the Company.

President - Oliver Hoar

Chairman of the Board - Peter Sheppard

Chief Executive Officer of the Company - Peter Sheppard

The business address of the above individuals is R.H. Sheppard Co., Inc., 101 Philadelphia Street, P.O. Box 877, Hanover, PA 17331.

d. Provide the name of an attorney, if any, who will serve as the legal contact for your Company in this matter.

Robert E. Scott, Jr.
Semmes, Bowen & Semmes
25 S. Charles Street, Suite 1400
Baltimore, MD 21201
PH: 410.576.4725
FX: 410.539.5223
Email: rscott@semmes.com

e. If your Company is a subsidiary or affiliate of another corporation, or has subsidiaries itself, identify each such entity and its relationship to your Company.

Not applicable

f. Identify the state and date of incorporation and the agent for service of process in the State of incorporation and in the State of New Jersey for your Company and for each entity identified in your response to Question 1(e) above.

State of incorporation - Pennsylvania

Agent for Service of Process - William H. Heiser, Executive Vice President/CFO, R.H. Sheppard Co., 101 Philadelphia Street, P.O. Box 877, Hanover, PA 17331.

g. If the Company is a successor to, or has been succeeded by another entity, identify each such other entity and provide the same information requested above for each.

Not applicable.

h. If the Company transacted business with SBD in the name of an entity not already disclosed above, give the name of such entity and state its relationship to the Company.

Not applicable.

2. State whether any of your Company's facilities has ever conducted any business transactions of any nature with Superior Barrel and Drum Company, Inc. ("SBD"), including but not limited to the sale, purcahse, removal, disposal, treatment, or storage of any barrels, drums, totes, overpacks or other containers (hereinafter collectively referred to as "Containers"). Answer X Yes; ____ No.

3. If your answer to Question 2, above, is yes, identify each Company facility involved in all such transactions and provide the following information for each facility:

a. State the name and address of each facility and describe each facility's operations;
R.H. Sheppard Co., Inc., Foundry Division ("RHS")
Rear 447 East Middle Street
P.O. Box 877 (York County)
Hanover, PA 17331

RHS is a foundry that manufacturers various products including: ductile iron, gray iron and compacted graphite iron castings.

b. For each facility, describe the nature of business relationship between that facility and SBD, including the nature of services rendered or products sold;

RHS purchased various raw materials, in 55 gallon drums, for use in its foundry to produce finished products. After the contents were used, the drum interiors were

cleaned, and on four separate (4) occasions, the empty drums were either sold, or provided at no charge, to Superior Barrel and Drum Co., Inc. for incineration, shredding and destruction.

c. Provide copies of any contracts, agreements or other arrangements between that facility and SBD;

See attached Exs. 1-4.

d. Provide copies of all permits issued pursuant to the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901, et seq. ("RCRA") for each facility; and

e. Identify the EPA RCRA identification number, if any, for each facility.

PAD000820670

4. If your answer to Question 2, above, is yes, did any of the transactions between any Company facility and SBD involve the transport or shipment of any Containers from that facility to SBD by any person, regardless of whether such Containers contained no material whatsoever, contained more or less than one inch of material, or may have been described as RCRA "empty"? Answer: _X_ Yes; _____ No

5. If your answer to Question 4, above, is yes for **each such transaction** provide the following information:

a. Identify the specific dates of each transaction, the Company facility involved with each transaction, the intended purpose of each transaction;

(1) February 27, 1990 - 43 empty drums were picked up and removed by Superior Barrel and Drum Co., Inc.;

(2) March 9, 1995 - 49 empty drums were picked up and removed by Superior Barrel and Drum Co., Inc.;

(3) June 16, 1995 - 288 empty drums were picked up and removed by Superior Barrel and Drum Co., Inc.; and

(4) September 24, 1996 - 200 empty drums were picked up and removed by Superior and Drum Co., Inc.

All of the above empty drums were picked up at the RHS facility in Hanover, PA, by SBD for incineration, shredding and destruction.

b. Provide copies of all documents relating in any way to each transaction, including but not limited to copies of delivery receipts, invoices, bills of lading, purchase orders or payment devices; and

See attached Exs 1-4.

c. Identify all persons who might have knowledge of the transaction or who had any responsibility regarding the transaction.

Fred M. Smyser, address unknown. Mr. Smyser was the former Safety Director at RHS who left the employ of RHS in November 1996.

6. For each company facility identified in response to Question 5, above, for the time period from 1974 to 2013:

a. Describe the facility's operation;

RHS purchased various raw materials, in 55 gallon drums, for use in its iron foundry to produce finished products. After the contents were used, the drum interiors were cleaned and then sold, or provided at no charge, to Superior Barrel and Drum Co. for incineration, shredding and destruction. These drums were not used for any other purpose.

b. Identify all chemicals used as raw materials in, that facility's operations;

Copies of MSDS of products that were sent to RHS in 55 gallon drums, and used in the foundry business, during the applicable time period, are attached as Exs. 5- 21. It is unknown at this time which specific manufacture's empty drum was sent to SBD.

c. Identify all chemicals contained in products produced at that facility;

See b. above.

d. Identify all chemicals used to clean equipment or machinery at that facility.

Not applicable.

e. Identify the nature and chemical constituents of all waste streams at that facility and their disposition;

Not applicable.

f. Identify any other chemicals used at that facility and describe their use; and

Not applicable.

g. Provide all Material Safety Data Sheets (MSDS) for all chemicals listed in answer to this Question 6.

See attached Exs. 5-21.

7. Was any Container identified in response to Question 5, above, previously used to contain any material? _X_ Yes; _____ No. If your answer is yes, for each such Container provide the following:

a. Identify each material previously contained within such Container, including its specific chemical constituents, physical state, quantity by volume and weight, and hazardous and other characteristics;

As noted in 6.b. above, it is unknown at this time which specific manufacture's empty drum were sent to SBD. The MSDS of the raw material products that were purchased by RHS during the relevant time period are attached as Exs. 5-21.

b. Provide all written analyses or other documents prepared for or relating to each such material which may be in the custody or control of the Company; and

See attached MSDS, Exs. 5-21.

c. Provide all material safety data sheets (MSDS) relating to each such material.

See attached MSDS, Exs. 5-21.

8. Did any Container that was the subject of any transaction identified in response to Question 5, above - contain any material whatever, in any quantity, at the time of its transport or shipment from the Company facility, regardless of whether or not it is or was ever alleged to be "empty" under RCRA, or alleged to contain less than one inch of material? ____ Yes; _X_ No.

9. If your Answer to Question 8 is yes, for each Container that contained any material whatever, if any quantity, at the time of its transport or shipment from the Company facility:

Not applicable.

a. Identify each such material, including its specific chemical constituent(s), physical state, quantity by volume and weight, and hazardous and other characteristics;

b. Provide all written analyses or other documents prepared for or relating to each such material which may be in the custody or control of the Company; and

c. Provide all material safety data sheets (MSDS) relating to each such material.

10. Do you contend that any Container that was the subject of any transaction identified in response to Question 5, above, did NOT contain any material whatever, in any quantity, at the time of its transport or shipment from the Company facility? Answer: __X__ Yes; _____ No.

11. If you answer to Question 10 is yes, for each such Container provide all facts upon which you rely for your assertion.

RHS purchased various raw materials, in 55 gallon drums, for use in its foundry to produce finished products. After the contents were used, the drum interiors were cleaned, and on four separate (4) occasions, the empty drums were either sold, or provided at no charge, to Superior Barrel and Drum Co., Inc. for incineration, shredding and destruction.

12. For those transactions identified in response to Question 5, was any treatment or cleaning of any Container performed by any person prior to the time that the Container was transported or shipped from the Company to SBD, including any process or process by which the Container was empties, drained, wiped or otherwise cleaned? Answer: _X_ Yes; _____ No.

13. If your answer to Question 12, above, is yes, for each such Container provide a detailed description of all such treatment, including any emptying, draining, wiping or cleaning, and identify all chemicals used in such treatment or cleaning.

The contents of all drums were used in the foundry. All drums were then cleaned and any residual amounts removed. Only empty drums were picked up by Superior Barrel and Drum Company, Inc. for incineration, shredding and destruction.

14. For each transaction identified in response to Question 5 involving any third-party transporter, identify each such transporter, including the name and address of such transporter, and identify in which of the transactions such transporter acted.

The identity of the company that picked up and transported the empty 55 gallon drums is unknown. Superior Barrel and Drum Co. made all arrangements for the pick up and transportation of the drums.

15. Identify each person consulted in responding to these questions and all questions on which he or she was consulted.

William H. Heiser, Julie L. Smith and Fred M. Smyser. They relied upon their personal recollection as well as information obtained from written records, copies of which are attached.

16. Identify any other person or entity (e.g., individual, company, partnership, etc.) having knowledge of facts relating to the questions which are the subject of this inquiry. For each such person that you identify, provide the name, address, and telephone number of that person, and the basis of your belief that he or she has such knowledged. For past and present employees, include their job title(s) and a description of the responsibilities.

Fred M. Smyser, former Safety Director at RHS, whose present address is unknown.

17. Supply any additional information or documents that may be relevant or useful to identify other sources who disposed of or transported Containers to the Site.

None.

B1535133.WPD

CERTIFICATION OF ANSWERS TO REQUEST FOR INFORMATION
Superior Barrel and Drum Site, Elk, Gloucester County, New Jersey

State of PA :

County of York :

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document (response to EPA Request for Information) and all documents submitted herewith, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete, and that all documents submitted herewith are complete and authentic unless otherwise indicated. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I am also aware that I am under a continuing obligation to supplement my response to EPA's Request for Information if any additional information relevant to the matters addressed in EPA's Request for Information or my response thereto should become known or available to me.

WILLIAM E. HEISER
NAME (print or type)

EXECUTIVE VP/CFO
TITLE (print or type) R. H. SHEPPARD CO., INC

William E Heiser
SIGNATURE

Sworn to before me this 21st
day of October, 2014

Peggy L. Altland
Notary Public

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Peggy L. Altland, Notary Public
Hanover Boro, York County
My Commission Expires June 10, 2015
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

R. H. Sheppard Co., Inc.
Post Office Box 877
Hanover, PA 17331-0877

PHONE: 717-637-3751
FAX: 717-633-4128
DUNS: 00-300-8521

PURCHASE ORDER

NOTE: This number must appear on all shipments, packing slips, invoices, etc.

Page: 1

PO Number: PH05229

PO Date: 9/24/96

Vendor:
SUPERIOR DRUM CO., INC.
P.O. BOX 741
GLASSBORO, NJ
08028

Ship To:
R.H. Sheppard Co. Inc.
101 Philadelphia St.
P.O.Box 877 (York County)
Hanover, Pa. 17331

Confirm To: ATTEN: HERB TOY

Buyer: Sarah Hughes <X116

Terms	Taxable	FOB shipping point	Vendor
Net 30 Days	No	Yes	SUPDRM

Shipping Instructions: BEST-WAY

Line #	Qty Ordered	Part Number / Description	Unit Price	Extended Amount
10	200EA	RHS part #: SERV100291 Plant Vendor part #: DRUM DISPOSAL Description: DRUM DISPOSAL- TO BE INCINERATED, SHREDDED AND RECYCLED Manuf. part #: Account #: 59993000 Req #: 54386 Job/Test #: Eng #: Releases: Quantity Date Quantity Date 200 10/09/96	7.00000	1,400.00
				1,400.00

Questions/Comments regarding this order should be directed to Dan Fleischman (Buyer) at (717) 637-3751, EXT 116. Please reference R.H. Sheppard part number when invoicing.

An Equal Opportunity Employer M/F/H/V
All initial shipments of applicable materials must be accompanied by an MSDS.

Acknowledgement of this purchase order is required.

By ______________________

SUPERIOR BARREL AND DRUM CO. INC.
P.O. BOX 741 • GLASSBORO, NJ 08028 • (609) 881-5866

#SC 3995

NAME J H Sheppard Co

ADDRESS 121 Phila St (& Mill St)

CITY Hanover STATE PA ZIP 17 [illegible]

CUSTOMER P.O. [illegible]

DATE [illegible]-9-95

QUANTITY	DESCRIPTION	PRICE	AMOUNT
49	Empty Chemical Drums	N-C	

REC'D

EMPTY DRUM CERTIFICATION

I hereby certify that these drums are "empty" as that term is defined in the National Environmental Protection Agency regulations 40 CFR 261.7, and that they have been properly prepared for transportation under the regulations of the U.S. Department of Transportation, 49 CFR 173.29.

Print Name FRED M. [illegible]

Signature [signature]

*With regard to most regulated residues, EPA's 40 CFR 261.7 says:

A container ... is empty if:

(i) All wastes have been removed that can be removed using the practices commonly employed to remove materials from that type of container, e.g., pouring, pumping, and aspirating.

and

(ii) No more than 2.5 centimeters (one inch) of residue remain on the bottom of the container.

EPA has explained this rule, saying that "one inch of waste material is an overriding constraint and may remain in an empty container only if it cannot be removed by normal means. The rationale for this provision is that there are certain tars and other extremely viscous materials that will remain in the container even after the container is emptied by normal means."

For residues of products specifically listed by name in 40 CFR 261.33(e), EPA says the container is empty only "if the container ... has been triple-rinsed using a solvent capable of removing" the product, or has been cleaned by another method shown to achieve equivalent removal.

**DOT's 49 CFR 173.29 says that all openings on the empty container must be closed and that all markings and labels must be in place as if the drum were full of its original contents. A DOT shipping paper is not required for transportation of a drum for reconditioning via contract or private motor carrier. DOT placarding is not required for vehicles carrying empty containers.

"DEALER IN STEEL DRUMS"

SUPERIOR Barrel and Drum Co., Inc.

New - Used - Reconditioned

218 CRAFTON AVENUE, PITMAN, N.J. 08071

(609) 589-6593

P. O. No.

Date 27 Feb 70

No. 006776

R H Sharpe Co

Hanover Pa

Quantity	Description	Amount
43	Empty Drums Removed off N/C	

Received by

SUPERIOR BARREL AND DRUM CO. INC.
P.O. BOX 741 • GLASSBORO, NJ 08028 • (609) 881-5866

RHS 61495

NAME R.H. Sheppard Co. #14 trailer

DATE	INVOICE NUMBER	DETAIL	AMOUNT CHARGED	AMOUNT RECEIVED	YOUR NEW BALANCE	YOUR OLD BALANCE	NAME
6-16-95	13124	FDY 1446	2016 –		2016 –		Sheppard Co. R.H.

EXHIBIT 4 p. 1 of 3

No 13124

SUPERIOR Barrel and Drum Co., Inc.
New - Used - Reconditioned
P.O. BOX 741, GLASSBORO, NJ 08028
(609) 881-5866

NO. RH S 61495
YOUR ORDER NO. FDY 1446

R.H. Sheppard Co. Inc
PO Box 877
Hanover Penna
17331-0877

6-16-95 19

TERMS: Net 15 days

(#14 Trailer)

2	88	Vety Step Chemical Drums Removed for Incineration Only and Shredding	7		2016 –

6-14-95 - PM - Cut heads off drums and reloaded onto #11 trailer -
6-15-95 - AM - unloaded in Kuwait ?? and incinerated - reloaded on #11 trailer -
6-15-95 - PM - unloaded in Century ?? at scrap metal yard and shredded as unloaded from trailer.
completed 6-14-95 per Herb T.

RECEIVED
JUN 19 1995

L940C05171

method shown to achieve equivalent removal.

**DOT's 49 CFR 173.29 says that all openings on the empty container must be closed, and that all markings and labels must be in place as if the drum were full of its original contents. A DOT shipping paper is not required for transportation of a drum for reconditioning via contract or private motor carrier. DOT placarding is not required for vehicles carrying empty containers.

"DEALER IN STEEL DRUMS"

SUPERIOR BARREL AND DRUM CO. INC.
P.O. BOX 741 • GLASSBORO, NJ 08028 • (609) 881-5866

\# RHS 61495

NAME: R H Sheppard Co. #14 Trailer

ADDRESS:

CITY: Hanover STATE: Pa ZIP:

DATE: 6/14/95 CUSTOMER PO: FDY 1446

QUANTITY	DESCRIPTION	PRICE	AMOUNT
288	Dirty Open [illegible] Drums	@ 7.—	
	Returned for [illegible]		
	Only and then [illegible]		
	[illegible] destruction		

REC'D:

EMPTY DRUM CERTIFICATION

I hereby certify that these drums are "empty" as that term is defined in the National Environmental Protection Agency regulations 40 CFR 261.7*, and that they have been properly prepared for transportation under the regulations of the U.S. Department of Transportation, 49 CFR 173.29**.

Print Name: Fred M. Snyder

Signature: [signature] 6-14-95

*With regard to most regulated residues, EPA's 40 CFR 261.7 says:

"A container . . . is empty if:

(i) All wastes have been removed that can be removed using the practices commonly employed to remove materials from that type of container, e.g., pouring, pumping, and aspirating,

and

(ii) No more than 2.5 centimeters (one inch) of residue remain on the bottom of the container . . ."

EPA has explained this rule, saying that "one inch of waste material is an overriding constraint and may remain in an empty container only if it cannot be removed by normal means. The rationale for this provision is that there are certain tars and other extremely viscous materials that will remain in the container even after the container is emptied by normal means."

For residues of products specifically listed by name in 40 CFR 261.33(e), EPA says the container is empty only "if the container . . . has been triple-rinsed using a solvent capable of removing" the product, or has been cleaned by another method shown to achieve equivalent removal.

**DOT's 49 CFR 173.29 says that all openings on the empty container must be closed, and that all markings and labels must be in place as if the drum were full of its original contents. A DOT shipping paper is not required for transportation of a drum for reconditioning via contract or private motor carrier. DOT placarding is not required for vehicles carrying empty containers.

"DEALER IN STEEL DRUMS"

RHS013

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date-Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

1. PRODUCT AND COMPANY IDENTIFICATION

MATERIAL: Monolithic Refractory
PRODUCT NAME(S): ALRAM 100, ALRAM 200, MINRO-AL RAM A50, MINRO-AL RAM A51, MINRO-AL RAM A51-W, MINRO-AL RAM A51-W CM, MINRO-AL RAM A52, DRI-VIBE 305A, DRI-VIBE 481A, DRI-VIBE 488A-FR, DRI-VIBE 652A, DRI-VIBE 94A, DRI-VIBE 95A, DRI-VIBE 952A

MANUFACTURER
Allied Mineral Products, Inc.
2700 Scioto Parkway
Columbus, OH 43221
Emergency Contact: Jeffrey Pfeiffer
Emergency Phone: 614-876-0244 (U.S.)
Customer Service: 614-876-0244
Jacco Bruijnzeel (EU) +31 166 605153
Eduardo José Togni Cardillo (Brazil) 35-2101-2222

24 HR. EMERGENCY TELEPHONE NUMBERS
614-876-0244

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATIONS

Health:

EU regulations require that materials containing 1% or greater respirable crystalline silica be classified. This material does not require classification according to EU regulations.

POTENTIAL HEALTH EFFECTS

EYES: Causes eye irritation.

SKIN: Substance may cause slight skin irritation.

INGESTION: Not a likely route of entry.

INHALATION: Avoid creating Dust. Do not breathe dust as it may cause permanent lung injury (Silicosis).

MEDICAL CONDITIONS AGGRAVATED: The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

ROUTES OF ENTRY: Inhalation

TARGET ORGAN STATEMENT: Lungs.

COMMENTS:

CAUTION:
Crystalline silica exists in several forms, the most common of which is quartz. If crystalline silica (quartz) is heated to more than 870°C (1600°F) it can change to a form of crystalline silica known as trydimite, and if crystalline silica (quartz) is heated to more than 1470°C (2680°F), it can change to a form of crystalline silica known as cristobalite. Crystalline silica as trydimite and cristobalite are more fibrogenic than crystalline silica as quartz. The OSHA PEL for crystalline silica as trydimite and cristobalite is one-half the PEL for crystalline silica (quartz); the ACGIH TLV for crystalline silica as trydimite and cristobalite is one-half the TLV for

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

crystalline silica as quartz.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Wt. %	CAS
Aluminum Oxide (non-fibrous)	80 - 100	1344-28-1
Magnesium Oxide	0 - 20	1309-48-4
Silica, Crystalline quartz	0 - 3	14808-60-7
Aluminum Silicate	0 - 10	1302-93-8
Steel Fiber	0 - 5	N/A

4. FIRST AID MEASURES

EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.

SKIN: Wash with soap and water.

INGESTION: Drink plenty of water. Consult a physician.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

EYES: Causes eye irritation.

SKIN: Contact may cause skin irritation.

INGESTION: Not a likely route of entry.

INHALATION: May include shortness of breath, wheezing, coughing, and sputum production.

ACUTE TOXICITY: Overexposure to dust may aggravate respiratory conditions.

CHRONIC EFFECTS: Prolonged or repeated overexposure may cause lung damage.

5. FIRE FIGHTING MEASURES

GENERAL HAZARD: This product is noncombustible and will not ignite or contribute to the intensity of a fire.

EXTINGUISHING MEDIA: As appropriate for surrounding fire.

HAZARDOUS COMBUSTION PRODUCTS: Not Applicable

FIRE FIGHTING PROCEDURES: As appropriate for surrounding fire.

FIRE FIGHTING EQUIPMENT: As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

SMALL SPILL: Vacuum or sweep up material and place in a disposal container. Avoid dust generation.

LARGE SPILL: Clean up using methods which avoid dust generation. Compressed air should not be used to clean up spills. Wear appropriate personal protective equipment. Collect material in a compatible and appropriately labeled container. Dispose of material from processing, installation, maintenance, or tear-out operations in accordance with applicable federal, state, and local regulations.

ENVIRONMENTAL PRECAUTIONS

WATER SPILL: Dusts of as-manufactured refractory product have a low order of aquatic toxicity (rating TLm96: over 1000 ppm), are insoluble, and are not very mobile. Based upon this information, it is not believed to be a significant threat to the environment if accidentally released into water.

LAND SPILL: Dusts of as-manufactured refractory product are not believed to be a significant threat to the environment if accidentally released on land. Dust and material generated during maintenance and tear-out operations may be contaminated with other hazardous substances (e.g., metals, alkaline materials). Evaluation of dust and material from specific processes should be performed by a qualified environmental professional to determine if an environmental threat exists in the case of a release.

AIR SPILL: Exhaust ventilation is recommended to maintain airborne dust concentrations below regulatory exposure levels. Consult individual operating permits for allowable air emissions.

SPECIAL PROTECTIVE EQUIPMENT: Personal Protective Equipment should be worn as indicated in Section 8.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Keep dry and avoid exposure to moisture prior to use.

HANDLING: Use proper procedures for installation and operation. Contact manufacturer for proper procedures. Practice good housekeeping to minimize dust generation. Respirators should be worn during installation and removal of product if dust could be generated. Consult Section 8 for respirator selection information.

STORAGE: Store in a dry area.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

EXPOSURE GUIDELINES

OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)							
		EXPOSURE LIMITS					
		OSHA PEL		ACGIH TLV		SupplierOEL	
Chemical Name		ppm	mg/m³	ppm	mg/m³	ppm	mg/m³
Aluminum Oxide (non-fibrous)	TWA	[1]	15*,5^ [1]	[2]	10** [2]	[3]	NA [3]
Magnesium Oxide	TWA		15		10		NA
Silica, Crystalline quartz	TWA	[4]	0.1 [4]	[5]	0.025 [5]		NA
Aluminum Silicate	TWA		5.0		5.0		NA

OSHA TABLE COMMENTS:
1. * = Total dust, ^ = Respirable fraction
2. ** The value is for inhalable particulate matter containing no asbestos and <1 % crystalline silica.
3. Not Applicable
4. OSHA has issued a proposed silica standard lowering the PEL to 0.05 mg/m³ for silica, crystalline quartz - respirable fraction. The proposed standard maintains the PEL for cristobalite at 0.05 mg/m³.
5. Silica exposure limits listed are for respirable fractions.

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Wear safety glasses with side shields (or goggles) and a face shield.

SKIN: Use rubber gloves. Wash thoroughly after handling.

RESPIRATORY: If it is not possible to reduce airborne exposure levels to below the OEL with ventilation, use the table below to assist you in selecting respirators that will reduce personal exposures to below the OEL. This table is part of the NIOSH Respirator Selection Logic, 2004, Chapter III, Table 1, "Particulate Respirators". The full document can be found at www.cdc.gov/niosh/topics/respirators/; the user of this MSDS is directed to that site for information concerning respirator selection and use.

The assigned protection factor (APF) is the minimum anticipated level of protection provided by each type of respirator worn in accordance with an adequate respiratory protection program. For example, an APF of 10 means that the respirator should reduce the airborne concentration of a particulate by a factor of 10, so that if the workplace concentration of a particulate was 150 ug/m³, then a respirator with an APF of 10 should reduce the concentration of particulate to 15 ug/m³.

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date-Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

Assigned Protection Factor[1]	Type of Respirator (Use only NIOSH-certified respirators)
10	Any air-purifying elastomeric half-mask respirator equipped with appropriate type of particulate filter.[2] Appropriate filtering facepiece respirator.[2,3] Any air-purifying full facepiece respirator equipped with appropriate type of particulate filter. Any negative pressure (demand) supplied-air respirator equipped with a half-mask.
25	Any powered air-purifying respirator equipped with a hood or helmet and a high efficiency (HEPA) filter. Any continuous flow supplied-air respirator equipped with a hood or helmet.
50	Any air-purifying full facepiece respirator equipped with N-100, R-100, or P-100 filter(s). Any powered air-purifying respirator equipped with a tight-fitting facepiece (half or full facepiece) and a high-efficiency filter. Any negative pressure (demand) supplied-air respirator equipped with a full facepiece. Any continuous flow supplied-air respirator equipped with a tight-fitting facepiece (half or full facepiece). Any negative pressure (demand) self-contained respirator equipped with a full facepiece.
1000	Any pressure-demand supplied-air respirator equipped with a half-mask.
	1. The protection offered by a given respirator is contingent upon (1) the respirator user adhering to complete program requirements (such as the ones required by OSHA in 29CFR 1910.134), (2) the use of NIOSH certified respirators in their approved configuration, and (3) individual fit testing to rule out those respirators that cannot achieve a good fit on individual workers. 2. Appropriate means that the filter medium will provide adequate protection against the particulate in question. 3. An APF of 10 can only be achieved if the respirator is qualitatively or quantitatively fit tested on individual workers.

PROTECTIVE CLOTHING: Wear clothing which minimizes skin contact or exposure.

WORK HYGIENIC PRACTICES: Use good personal hygiene when handling this product. Wash hands after use, before smoking, or before using the toilet.

OTHER USE PRECAUTIONS: Recommend yearly chest X-rays and vital capacity tests for employees regularly exposed to silica for early detection of silicosis. Comply with all guidelines for crystalline silica exposure. The IARC has classified crystalline silica inhaled in the form of quartz or cristobalite carcinogenic to humans (Group I). After exposure to temperatures above 1600 F (870 C), cristobalite and tridymite are formed.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Granular solid

ODOR: No Odor

APPEARANCE: Granular to fine material.

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

COLOR: White, gray, brown

pH: Not Applicable

PERCENT VOLATILE: Not Applicable

FLASHPOINT AND METHOD: Not Applicable

FLAMMABLE LIMITS: Not Applicable

VAPOR PRESSURE: Not Applicable

VAPOR DENSITY: Not Applicable

BOILING POINT: Not Applicable

MELTING POINT: Reference product literature.

SOLUBILITY IN WATER: < 3%

Notes: by weight

EVAPORATION RATE: Not Applicable

SPECIFIC GRAVITY: 2.5 to 3.500 g/cc

10. STABILITY AND REACTIVITY

STABILITY: Stable.

POLYMERIZATION: Hazardous polymerization will not occur.

CONDITIONS TO AVOID: Not Applicable

HAZARDOUS DECOMPOSITION PRODUCTS: Not Applicable

INCOMPATIBLE MATERIALS: Strong acids, bases, oxidizing agents.

11. TOXICOLOGICAL INFORMATION

ACUTE

NOTES: Acute silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period.

EYE EFFECTS: Will irritate eyes causing redness, pain.

CHRONIC: SILICOSIS- The major concern is silicosis, caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), and accelerated (or acute). Chronic or Ordinary Silicosis is the most common form of silicosis, and can occur after many years of exposure to relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis. Simple Silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function, or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated Silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough, and sputum production. Complicated silicosis or PMF may lead to death.

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (corpulmonale). Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated Silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid. Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough, and weight loss. Acute silicosis is fatal.

SCLERODERMA- There is evidence that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of scleroderma, an immune system disorder manifested by a fibrosis (scarring) of the lungs, skin, and other internal organs. Recently, the American Thoracic Society noted that "there is persuasive evidence relating scleroderma to occupational silica exposures in settings where there is appreciable silicosis risk". The following may be consulted for additional information on silica, silicosis, and scleroderma (also known as progressive systemic sclerosis): Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

TUBERCULOSIS- Individuals with silicosis are at increased risk to develop tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

NEPHROTOXICITY- There are several recent studies suggesting that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of kidney disorders. The following may be consulted for additional information on silica, silicosis, and nephrotoxicity: Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Ramond (1994). "Further evidence of human silica nephrotoxicity in occupationally exposed workers", British Journal of Industrial Medicine, Vol 50, No. 10, pp. 907-912 (1993). "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997).

ARTHRITIS- There are recent studies suggesting that exposure to respirable crystalline silica or that the disease silicosis is associated with the increased incidence of arthritis. The following may be consulted for additional information on silica exposure and arthritis: American Journal of Industrial Medicine, Volume 35, pp. 375-381 "Connective Tissue Disease and Silicosis", Rosenman KD; Moore-Fuller M.; Reilly MJ. (1999). Environmental Health Perspective, Volume 107, pp. 793-802 "Occupational Exposure to Crystalline Silica and Autoimmune Disease", Parks CG, Conrad K, Cooper GS. (1999).

CARCINOGENICITY

IARC: The International Agency for Research on Cancer ("IARC") concluded that there was "sufficient evidence in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and that there is "sufficient evidence in experimental animals for the carcinogenicity of quartz and cristobalite". The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group I)". The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstance studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date-Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

on external factors affecting its biological activity or distribution of its polymorphs". For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 68, "Silica, Some Silicates..." (1997). (Emphasis added).

NTP: Crystalline Silica (respirable) - NTP reports may reasonably be anticipated to be a carcinogen.

OSHA: Crystalline silica (quartz) is not regulated by the U.S. Occupational Safety and Health Administration as a carcinogen. There is substantial literature on the issues of the carcinogenicity of crystalline silica, which the reader should consult for additional information. A summary of the literature is set forth in "Exposure to crystalline silica and risk of lung cancer; the epidemiological evidence", Thorax, Volume 51, pp. 97-102 (1996). The official statement of the American Thoracic Society on the issue of silica carcinogenicity was published in "Adverse Effects of Crystalline Silica Exposure", American Journal of Respiratory and Critical Care Medicine, Volume 155, pp. 761-765 (1997). The official statement concluded that "The available data support the conclusion that silicosis produces increased risk for bronchogenic carcinoma. The cancer risk may also be increased by smoking and other carcinogens in the workplace. Epidemiologic studies provide convincing evidence for increased cancer risk among tobacco smokers with silicosis. For workers with silicosis, the risks for lung cancer are relatively high and consistent among various countries and investigators. Silicosis should be considered a condition that predisposes workers to an increased risk of lung cancer". Id. at 763.

Notes: ACGIH classification for crystalline silica: A2 (Suspected Human Carcinogen)

TARGET ORGANS: Lungs

MUTAGENICITY: For Crystalline silica, DNA damage , intratracheal rat, @ 3mg/kg TXAPA9 189, 84, 2003 and Micronucleus test, human lung, @ 40 ug/cm2 MUREAV 335, 27, 1995.

GENERAL COMMENTS: A study reported in the Journal of Occupational and Environmental Medicine concluded: "Respirable crystalline silica exposure more than 4 mg/m^3-years (cumulative) or more than 0.15 mg/m^3 (average) were strongly associated with silicosis, but unrelated to lung cancer risks." Mundt KA, et al. Respirable Crystalline Silica Exposure-Response Evaluation of Silicosis Morbidity and Lung Cancer Mortality in the German Porcelain Industry Cohort. Journal of Occupational and Environmental Medicine. 2011;53:282-289.

12. ECOLOGICAL INFORMATION

GENERAL COMMENTS: Dusts of as-manufactured refractory product have a low order of aquatic toxicity (rating TLm96: over 1000 ppm), are insoluble, and are not very mobile. Based upon this information, it is not believed to be a significant threat to the environment if accidentally released on land or into water. However, dust and material generated during maintenance and tear-out operations may be contaminated with other hazardous substances (e.g., metals, alkaline materials). Evaluation of dust and material from specific processes should be performed by a qualified environmental professional to determine if an environmental threat exists in the case of release.

13. DISPOSAL CONSIDERATIONS

PRODUCT DISPOSAL: The as-manufactured refractory product or refractory dust is not considered a hazardous waste as defined by 40 CFR 261. However, dust and material generated during maintenance and tear-out operations may be contaminated with other hazardous substances (e.g., metals, alkaline materials). Therefore, appropriate waste analysis may

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date-Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

be necessary to determine proper disposal. Waste characterization and disposal/treatment methods should be determined by a qualified environmental professional in accordance with applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Not Regulated

15. REGULATORY INFORMATION

UNITED STATES

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS: All ingredients in this mixture are in compliance with TSCA.

CALIFORNIA PROPOSITION 65: WARNING: This product contains crystalline silica, a chemical known to the State of California to cause cancer.

RCRA STATUS: Not regulated

COMMENTS This product has been classified in accordance with the hazard criteria of the **Controlled Products Regulations**, and the MSDS contains all the information required by the **Controlled Products Regulations**.

16. OTHER INFORMATION

REASON FOR ISSUE: Format Change

APPROVED BY: Doug K. Doza **TITLE:** V.P. R&D, Manufacturing

PREPARED BY: Jeffrey Pfeiffer

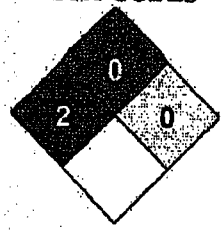
INFORMATION CONTACT: 614-876-0244

REVISION SUMMARY: This MSDS replaces the 7/27/2011 MSDS.

HMIS RATING

HEALTH	* 2
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	

NFPA CODES



MANUFACTURER DISCLAIMER: All information provided here is based on data believed to be reliable. However, THE INFORMATION AND THE PRODUCT ARE PROVIDED WITHOUT ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO REPRESENTATIONS AND WARRANTIES REGARDING ACCURACY OR CORRECTNESS, THE EFFECTS OF USING THE PRODUCT, THE RESULTS TO BE OBTAINED, FITNESS FOR A PARTICULAR PURPOSE, OR THE SAFETY OR TOXICITY OF THE PRODUCT. It is the users' responsibility to determine the safety, toxicity, and suitability for their use of the product

SAFETY DATA SHEET

Date Issued : 3/27/2006
MSDS No : DS0005
Date-Revised : 12/11/2013
Revision No : 6

Monolithic Refractory

and to comply with all applicable statutes and regulations. The conditions or methods of handling, storage, use, and disposal of the product are beyond our control. For this and other reasons, Allied Mineral Products, Inc. does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of, relating to, or in any way connected with the handling, storage, use, or disposal of this product. This MSDS is not intended as a license to operate under, or a recommendation to infringe on, any patents. Appropriate warnings and safe handling instructions should be provided to handlers and users.

MATERIAL SAFETY DATA SHEET

MSDS No. 00870000
ENGLISH

1.0 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: AMOCO ANTI-RUST OIL NO. 2-V

MANUFACTURER/SUPPLIER:
Amoco Oil Company
200 East Randolph Drive
Chicago, Illinois 60601 U.S.A.

EMERGENCY HEALTH INFORMATION:
1 (800) 447-8735
EMERGENCY SPILL INFORMATION:
1 (800) 424-9300 CHEMTREC (USA)
OTHER PRODUCT SAFETY INFORMATION:
(312) 856-3907

2.0 COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS#	Range % by Wt.
Stoddard solvent (petroleum naphtha)	8052-41-3	60-100
Solvent-refined heavy paraffinic distillate	64741-88-4	10-30

(See Section 8.0, "Exposure Controls/Personal Protection", for exposure guidelines)

3.0 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Caution! Combustible. Can be harmful if high concentrations are inhaled. Prolonged or repeated contact may produce some skin irritation. Harmful or fatal if liquid is aspirated into lungs.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: No significant health hazards identified.

SKIN CONTACT: Prolonged or repeated contact may produce some skin irritation.

INHALATION: Can be harmful if high concentrations are inhaled. See "Toxicological Information" section (Section 11.0).

INGESTION: Harmful or fatal if liquid is aspirated into lungs.

HMIS CODE: (Health:1) (Flammability:2) (Reactivity:0)

NFPA CODE: (Health:1) (Flammability:2) (Reactivity:0)

4.0 FIRST AID MEASURES

EYE: Flush eyes with plenty of water.

SKIN: Wash exposed skin with soap and water. Get medical attention if irritation develops.

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get medical attention.

INGESTION: If swallowed, do NOT induce vomiting. Get immediate medical attention.

5.0 FIRE FIGHTING MEASURES

FLASHPOINT: 100°F(38°C) (minimum) (Cleveland open cup) ASTM D92

UEL: Not determined.

LEL: Not determined.

AUTOIGNITION TEMPERATURE: Not determined.

FLAMMABILITY CLASSIFICATION: Combustible Liquid.

EXTINGUISHING MEDIA: Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, foam, steam) or water fog.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Combustible liquid.

FIRE-FIGHTING EQUIPMENT: Firefighters should wear full bunker gear, including a positive pressure self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: Incomplete burning can produce carbon monoxide and/or carbon dioxide and other harmful products.

6.0 ACCIDENTAL RELEASE MEASURES

Remove or shut off all sources of ignition. Remove mechanically or contain on an absorbent material such as dry sand or earth. Keep out of sewers and waterways.

7.0 HANDLING AND STORAGE

HANDLING: Keep away from ignition sources (e.g., heat, sparks, or open flames). Use with adequate ventilation. Avoid prolonged or repeated contact with skin.

STORAGE: Store in combustible liquids storage area.

8.0 EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE: None required; however, use of eye protection is good industrial practice.

SKIN: Wear protective clothing and gloves if prolonged or repeated contact is likely.

INHALATION: Avoid breathing vapor and/or mist. If ventilation is inadequate, use NIOSH certified respirator that will protect against dust/mist.

ENGINEERING CONTROLS: Control airborne concentrations below the exposure guidelines.

EXPOSURE GUIDELINES:

Component	CAS#	Exposure Limits
Stoddard solvent (petroleum naphtha)	8052-41-3	OSHA PEL: 100 ppm(1989); 500 ppm (1971) ACGIH TLV-TWA: 100 ppm
Solvent-refined heavy paraffinic distillate	64741-88-4	OSHA PEL: 5 mg/m^3 (oil mist) (1989)(1971) ACGIH TLV-TWA: 5 mg/m^3 (oil mist) ACGIH TLV-STEL: 10 mg/m^3 (oil mist)

9.0 CHEMICAL AND PHYSICAL PROPERTIES

APPEARANCE AND ODOR:	Oily liquid. Yellow.
pH:	Not determined.
VAPOR PRESSURE:	Not determined.
VAPOR DENSITY:	Not determined.
BOILING POINT:	Not determined.
MELTING POINT:	Not determined.
SOLUBILITY IN WATER:	Negligible, below 0.1%.
SPECIFIC GRAVITY (WATER=1):	0.81
VISCOSITY:	1.1cSt at 40°C (typical) ASTM D445
POUR POINT:	

10.0 STABILITY AND REACTIVITY

STABILITY: Stable.

CONDITIONS TO AVOID: Keep away from ignition sources (e.g. heat, sparks, and open flames).

MATERIALS TO AVOID: Avoid chlorine, fluorine, and other strong oxidizers.

HAZARDOUS DECOMPOSITION: None identified.

HAZARDOUS POLYMERIZATION: Will not occur.

11.0 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY DATA:

EYE IRRITATION: Testing not conducted. See Other Toxicity Data.

SKIN IRRITATION: Testing not conducted. See Other Toxicity Data.

DERMAL LD50: Testing not conducted. See Other Toxicity Data.

ORAL LD50: Testing not conducted. See Other Toxicity Data.

INHALATION LC50: Testing not conducted. See Other Toxicity Data.

OTHER TOXICITY DATA:

Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

Oil mist: Repeated exposure to levels of oil mists in excess of the exposure limits may result in accumulation of oil droplets in pulmonary tissue and may lead to irritation of the nose and throat. No adverse health effect is expected to occur at or below the exposure limits.

Materials of this type have been shown to produce kidney damage in male rats following prolonged inhalation exposures. Following extensive research, this effect appears to be unique to the rat and of little or no relevance in terms of human health risk.

No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program, the U.S. Occupational Safety and Health Act, or the International Agency on Research on Cancer (IARC).

12.0 ECOLOGICAL INFORMATION

Ecological testing has not been conducted on this product.

13.0 DISPOSAL INFORMATION

Disposal must be in accordance with applicable federal, state, or local regulations. Residues and spilled material are hazardous waste. Enclosed-controlled incineration is recommended unless directed otherwise by applicable ordinances.

The container for this product can present explosion or fire hazards, even when emptied! To avoid risk of injury, do not cut, puncture, or weld on or near this container. Since the emptied containers retain product residue, follow label warnings even after container is emptied.

14.0 TRANSPORTATION INFORMATION

U.S. DEPT OF TRANSPORTATION

Shipping Name	:	Petroleum Distillates, N.O.S.
Hazard Class	:	Combustible liquid.
Identification Number	:	UN1268
Packing Group	:	III

INTERNATIONAL INFORMATION:

Sea (IMO/IMDG)
Shipping Name : Not determined.

Air (ICAO/IATA)
Shipping Name : Not determined.

European Road/Rail (ADR/RID)
Shipping Name : Not determined.

Canadian Transportation of Dangerous Goods
Shipping Name : Not determined.

15.0 REGULATORY INFORMATION

CERCLA SECTIONS 102A/103 HAZARDOUS SUBSTANCES (40 CFR PART 302.4): This product is not reportable under 40 CFR Part 302.4.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR PART 355): This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA TITLE III SECTIONS 311/312 HAZARDOUS CATEGORIZATION (40 CFR PART 370): This product is defined as hazardous by OSHA under 29 CFR Part 1910.1200(d).

SARA TITLE III SECTION 313 (40 CFR PART 372): This product is not regulated under Section 313 of SARA and 40 CFR Part 372.

U.S. INVENTORY (TSCA): Listed on inventory.

OSHA HAZARD COMMUNICATION STANDARD: Combustible liquid. Contains a component listed by OSHA. Contains a component listed by ACGIH.

EC INVENTORY (EINECS/ELINCS): Not determined.

JAPAN INVENTORY (MITI): Not determined.

AUSTRALIA INVENTORY (AICS): Not determined.

KOREA INVENTORY (ECL): Not determined.

CANADA INVENTORY (DSL): Not determined.

PHILIPPINE INVENTORY (PICCS): Not determined.

16.0 OTHER INFORMATION

Prepared by:

Environment, Health and Safety Department

Issued: February 12, 1996
Supersedes: June 20, 1995

This material Safety Data Sheet conforms to the requirements of ANSI Z400.1.

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.

MATERIAL SAFETY DATA SHEET

103

FOR INDUSTRIAL USE ONLY

1. Chemical Product and Company Identification

DESCRIPTION: **BORDEN® CORE OIL 279B**
PRODUCT CODE: 78-BB07A-.
PRODUCT TYPE: Core Oil Resin
APPLICATION: Oil Sand Cores

Manufacturer/Supplier Information

MSDS Prepared by:
Borden Chemical, Inc.
1401 Circle Avenue
Forest Park, IL 60130-2611

Emergency Phone Number
Poison Control Center
1-800-228-5635 ext 261

For additional health, safety or regulatory information, call 708-524-3412.

2. Composition, Information on Ingredients

The ingredients listed below have been associated with one or more immediate and/or delayed(*) health hazards. Risk of damage and effects depends upon duration and level of exposure. BEFORE USING, HANDLING, OR EXPOSURE TO THESE INGREDIENTS, READ AND UNDERSTAND THE MSDS.

		% by weight
64741-52-2	*Light Naphthenic Distillate (petroleum)	1-5
64741-53-3	Heavy Naphthenic Distillate (petroleum)	1-5
64742-47-8	*Hydrotreated Light Distillate (petroleum)	10-30
70592-78-8	*Distillates (petroleum), Vacuum	1-5

3. Hazards Identification

3.1 Emergency Overview

Appearance: Dark clear liquid
Odor: Linseed oil odor

CAUTION!
COMBUSTIBLE
May be harmful if inhaled.
Can cause central nervous system depression.
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK, 2000, NO: 128

HMIS Rating

```
      HEALTH = 2 (moderate)
FLAMMABILITY = 2 (moderate)
  REACTIVITY = 0 (minimal)
     CHRONIC = *
```

3.2 Potential Health Effects

Immediate Hazards

INGESTION: Not expected to be harmful under normal conditions of use.

INHALATION: May be harmful if inhaled. Liquid or vapor may cause irritation of nose, throat and lungs.
Can cause central nervous system depression.

SKIN: May cause irritation on prolonged or repeated contact.

EYES: May cause irritation on prolonged or repeated contact.

Light Naphthenic Distillate (petroleum) 64741-52-2
Can cause central nervous system depression. Signs and symptoms may include headache, dizziness, nausea, vomiting and drowsiness.

Hydrotreated Light Distillate (petroleum) 64742-47-8
Can cause central nervous system depression. Signs and symptoms may include headache, dizziness, nausea, vomiting, unconsciousness and even asphyxiation.

Distillates (petroleum), Vacuum 70592-78-8
Can cause central nervous system depression. Signs and symptoms may include headache, dizziness, nausea, vomiting and drowsiness.

Delayed Hazards

Light Naphthenic Distillate (petroleum) 64741-52-2
POSSIBLE CANCER HAZARD. May cause cancer based on animal data. This material has been listed by NTP, classified by IARC and/or regulated by OSHA as an animal carcinogen.

Hydrotreated Light Distillate (petroleum) 64742-47-8
May cause liver damage based on animal data.
May cause kidney damage based on animal data.
-- See Footnote C.

Distillates (petroleum), Vacuum 70592-78-8
POSSIBLE CANCER HAZARD. May cause cancer based on animal data. This material has been listed by NTP, classified by IARC and/or regulated by OSHA as an animal carcinogen.

Delayed Hazards

Footnote C: As of the date of issuance of this document, this material has not been listed by NTP, classified by IARC nor regulated by OSHA as a carcinogen.

4. First Aid Measures

INGESTION: If accidentally swallowed, dilute by drinking large quantities of water. Immediately contact poison control center or hospital emergency room for any other additional treatment directions.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Call a physician.

SKIN: In case of irritation, flush with water.

EYES: Immediately flush eyes with plenty of water. Call a physician if irritation persists.

5. Fire Fighting Measures

Flash point	148 F. (TCC)
Lower explosion limit	Not available
Upper explosion limit	Not available
Autoignition temperature	Not available

COMBUSTIBLE.
Keep away from heat and flame.
In case of fire, use dry chemical, foam or CO2. Water may be ineffective, but should be used to keep fire-exposed containers cool.

6. Accidental Release Measures

Eliminate all ignition sources. Large quantities: Enclose with diking material to prevent seepage into natural bodies of water, then consult Borden, Inc. Small quantities: Soak up with absorbent material and remove to a chemical disposal area.

7. Handling and Storage

7.1 Handling

Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of the material from eyes, skin and clothing.
Wash thoroughly after handling.
INHALATION: Avoid breathing vapor. Use with adequate ventilation.

7.1 Handling

SKIN: Avoid prolonged or repeated contact with skin and clothing.
EYES: Avoid prolonged or repeated contact with eyes.

7.2 Storage

Keep drum out of sun and away from heat.
Empty container may contain product residues. DO NOT cut, torch or reuse without commercial cleaning.
Never use air pressure to empty drums.
Do not use air to unload bulk trucks. Unload using pumps or an inert gas, such as nitrogen.
Keep away from heat, sparks, flame and other ignition sources.
Store at ambient temperature.
Use with adequate ventilation.
Do not store near strong oxidizing chemicals.

8. Exposure Controls/Personal Protection

8.1 Exposure Controls

ENGINEERING CONTROLS: The following exposure control techniques may be used to effectively minimize employee exposure: local exhaust ventilation, enclosed system design, process isolation and remote control in combination with appropriate use of personal protective equipment and prudent work practices. These techniques may not necessarily address all issues pertaining to your operations. We, therefore, recommend that you consult with experts of your choice to determine whether or not your programs are adequate.
If airborne contaminants are generated when the material is heated or handled, sufficient ventilation in volume and air flow patterns should be provided to keep air contaminant concentration levels below acceptable criteria.

8.2 Personal Protection

Where air contaminants can exceed acceptable criteria, use NIOSH/MSHA approved respiratory protection equipment. Respirators should be selected based on the form and concentration of contaminants in air in accordance with OSHA laws and regulations or other applicable standards or guidelines, including ANSI standards regarding respiratory protection. Use goggles if contact is likely. Wear impervious gloves as required to prevent skin contact.

8.3 Exposure Guidelines

Light Naphthenic Distillate (petroleum) 64741-52-2
ACGIH TLV: NONE ESTABLISHED
OSHA PEL: 5 mg/m³ TWA, Oil mist, mineral

Heavy Naphthenic Distillate (petroleum) 64741-53-3
ACGIH TLV: NONE ESTABLISHED

8.3 Exposure Guidelines

OSHA PEL: 5 mg/m³ TWA, Oil mist, mineral

Hydrotreated Light Distillate (petroleum) 64742-47-8
ACGIH TLV: 100 ppm (525 mg/m³) TWA, Stoddard solvent
OSHA PEL: 5 mg/m³ TWA, Oil mist, mineral
OTHER: 300 ppm (vendor recommendation)

Distillates (petroleum), Vacuum 70592-78-8
ACGIH TLV: NONE ESTABLISHED
OSHA PEL: 5 mg/m³ TWA, Oil mist, mineral

9. Physical and Chemical Properties

Appearance	Dark clear liquid
Color	Dark brown to black
Odor	Linseed oil odor
Odor threshold	Not available
Specific gravity	0.96-0.98
pH	Not applicable
Viscosity, Brookfield	120-160 Cps @ 25 C.
Freezing point	Not available
Solubility in water	Not available
Octanol/water partition coefficient	Not available
Vapor pressure @ 25 C	Not available
Vapor density (air=1)	Not available
Evaporation rate (butyl acetate=1)	Not available
Boiling point, 760 mm Hg	Not available

10. Stability and Reactivity

Normally stable as defined in NFPA 704-12(4-3.1).

Incompatibilities:

Strong oxidizers.

Decomposition products may include:

CO, CO2, particulate matter, hydrocarbons and other organic compounds including benzo[a]pyrene.

Hazardous polymerization:

Will not occur.

Other Hazards:

During core making, vapors of hydrocarbons may be released.

11. Toxicological Information

See Section 3 Hazards Identification information.
Light Naphthenic Distillate (petroleum) 64741-52-2
LC50: Not available
LD50: Not available

Heavy Naphthenic Distillate (petroleum) 64741-53-3
LC50: Not available
LD50: Not available

Hydrotreated Light Distillate (petroleum) 64742-47-8
LC50: Not available
LD50: Not available

Distillates (petroleum), Vacuum 70592-78-8
LC50: Not available
LD50: Not available

12. Ecological Information

Not determined.

13. Disposal Considerations

Recover free liquid. Absorb residue and dispose of according to local, state/provincial, and federal requirements.
Empty container: May contain explosive vapors. DO NOT cut, puncture or weld on or nearby.

14. Transport Information

14.1 U.S. Department of Transportation (DOT)

The data provided in this section is for information only and may not be specific to your package size. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

Combustible Liquid, N.O.S., (Petroleum Distillate), NA1993, III,
NA ERG(2000): 128

14.2 Canadian Transportation of Dangerous Goods (TDG)

Not determined.

15. Regulatory Information (Selected Regulations)

15.1 U.S. Federal Regulations

OSHA Hazard Communication Standard 29CFR1910.1200

This material is a "health hazard" and/or a "physical hazard" as determined when reviewed according to the requirements of the Occupational Safety and Health Administration 29 CFR Part 1910.1200 "Hazard Communication" Standard.

SARA Title III: Section 311/312

Fire hazard
Immediate health hazard
Delayed health hazard

SARA Title III Section 313 and 40 CFR Part 372

This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.

None required per SARA TITLE III SECTION 313.

TSCA Section 8(b) Inventory

All reportable chemical substances are listed on the TSCA Inventory. We rely on certifications of compliance from our suppliers for chemical substances not manufactured by Borden.

15.2 Canadian Regulations

Workplace Hazardous Materials Information System (WHMIS)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR) and the MSDS contains all the information required by the CPR.

CLASS D, DIV 2A, 2B
CLASS B, DIV 3

Canadian Environmental Protection Act (CEPA)

All reportable chemical substances are listed on the Domestic Substances List (DSL) or otherwise comply with CEPA new substance notification requirements.

National Pollutant Release Inventory (NPRI)

This product contains the following chemical(s) subject to the reporting requirements of the Canadian Environmental Protection Act (CEPA) subsection 16(1), National Pollutant Release Inventory.

None required.

15.3 State Regulations

Pennsylvania Worker & Community RTK Act (Pa. Act 1984-1159)

The listing of a chemical does not necessarily indicate it is hazardous.

Linseed Oil	8001-26-1
Mineral Oil Mist	64741-52-2
Heavy Naphthenic Distillate (petroleum)	64741-53-3
Hydrotreated Light Distillate (petroleum)	64742-47-8
Distillates (petroleum), Steam-Cracked, Polymers With Ethylene-Manuf.-By-Product C5-Cut Alkene Oligomers	68131-76-0
Mineral Oil Mist	70592-78-8

16. Other Information

User's Responsibility

The OSHA Hazard Communication Standard 29CFR 1910.1200 and the Workplace Hazardous Materials Information System (WHMIS) require that the information contained on these sheets be made available to your workers. Educate and train your workers regarding OSHA and WHMIS precautions. Instruct your workers to handle this product properly. Consult with appropriate experts to guard against hazards associated with use of this product and its ingredients.

Disclaimer

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE, except that the product shall conform to contracted specifications, and that the product does not infringe any valid United States or Canadian patent. No claim of any kind shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

CUR ISSUE: 20-NOV-00
PREVIOUS ISSUE: 09-APR-98

PRINT DATE: March 8, 2001 01:18 PM

MATERIAL SAFETY DATA SHEET

FOR INDUSTRIAL USE ONLY

102

1. Chemical Product and Company Identification

DESCRIPTION: **Liqui Core Hesive™ 8**
PRODUCT CODE: 79-6206.-.
PRODUCT TYPE: Inorganic Mixture
APPLICATION: Core Paste

Manufacturer/Supplier Information

MSDS Prepared by:
Borden Chemical, Inc.
4243 South Avenue
Toledo, OH 43615-6233

Emergency Phone Number
Poison Control Center
1-800-228-5635 ext 261

For additional health, safety or regulatory information, call 708-524-3412.

2. Composition, Information on Ingredients

The ingredients listed below have been associated with one or more immediate and/or delayed(*) health hazards. Risk of damage and effects depends upon duration and level of exposure. BEFORE USING, HANDLING, OR EXPOSURE TO THESE INGREDIENTS, READ AND UNDERSTAND THE MSDS.

	% by weight
1332-58-7 *Kaolin	10-30
1344-09-8 Sodium Silicate	10-30

3. Hazards Identification

3.1 Emergency Overview

Appearance: Heavy cream
Odor: Odorless

CAUTION!
Not a significant fire hazard.
May be harmful if inhaled.
Skin irritant.
Eye irritant.

HMIS Rating

HEALTH = 2 (moderate)
FLAMMABILITY = 0 (minimal)
REACTIVITY = 0 (minimal)
CHRONIC = *

READ NEXT PAGE

3.2 Potential Health Effects

Immediate Hazards

INGESTION: Not expected to be harmful under normal conditions of use.
If accidentally swallowed, burns or irritation to mucous membranes, esophagus or GI tract can result.

INHALATION: May be harmful if inhaled. Vapor may cause irritation of nose, throat and lungs.

SKIN: Causes irritation.

EYES: Causes irritation.

Delayed Hazards

Kaolin 1332-58-7
Chronic inhalation has resulted in benign pneumoconiosis.
Pre-existing respiratory disorders may be aggravated by exposure.
-- See Footnote C.

Footnote C: As of the date of issuance of this document, this material has not been listed by NTP, classified by IARC nor regulated by OSHA as a carcinogen.

4. First Aid Measures

INGESTION: If accidentally swallowed, dilute by drinking large quantities of water. Immediately contact poison control center or hospital emergency room for any other additional treatment directions.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Call a physician.

SKIN: Flush with plenty of water. Remove contaminated clothing. Call a physician if irritation persists.

EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held apart during irrigation to insure water contact with entire surface of eyes and lids. Call a physician.

5. Fire Fighting Measures

Flash point	Non-Flammable
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Autoignition temperature	Not available

5. Fire Fighting Measures

Will not burn.
In case of fire, water should be used to keep fire-exposed containers cool.

6. Accidental Release Measures

Sweep (scoop) up and remove to a chemical disposal area. Prevent entry into natural bodies of water.

7. Handling and Storage

7.1 Handling

Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of the material from eyes, skin and clothing.
Wash thoroughly after handling.
INHALATION: Avoid breathing vapor. Use with adequate ventilation.
SKIN: Avoid contact with skin and clothing.
EYES: Avoid contact with eyes.

7.2 Storage

Keep container closed.
Store in a cool, dry place.
Empty container may contain product residues. DO NOT cut, torch or reuse without commercial cleaning.
Store at ambient temperature.
Use with adequate ventilation.

8. Exposure Controls/Personal Protection

8.1 Exposure Controls

ENGINEERING CONTROLS: The following exposure control techniques may be used to effectively minimize employee exposure: local exhaust ventilation, enclosed system design, process isolation and remote control in combination with appropriate use of personal protective equipment and prudent work practices. These techniques may not necessarily address all issues pertaining to your operations. We, therefore, recommend that you consult with experts of your choice to determine whether or not your programs are adequate.
If airborne contaminants are generated when the material is heated or handled, sufficient ventilation in volume and air flow patterns should be provided to keep air contaminant concentration levels below acceptable criteria.

8.2 Personal Protection

Where air contaminants can exceed acceptable criteria, use NIOSH/MSHA approved respiratory protection equipment. Respirators should be selected based on the form and concentration of contaminants in air in accordance with OSHA laws and regulations or other applicable standards or guidelines, including ANSI standards regarding respiratory protection. Use goggles if contact is likely. Wear impervious gloves as required to prevent skin contact.

8.3 Exposure Guidelines

Kaolin 1332-58-7
ACGIH TLV: 2 mg/m³ TWA, respirable fraction
OSHA PEL: 15 mg/m³ TWA, total dust; 5 mg/m³ TWA, respirable fraction
REMANDED PEL: 10 mg/m³ TWA, total dust; 5 mg/m³ TWA, respirable fraction
OSHA 1989 PEL remanded, but in effect in some states

Sodium Silicate 1344-09-8
ACGIH TLV: 10 mg/m³ TWA, inhalable; Particulate (insoluble) Not Otherwise Classified
OSHA PEL: 5 mg/m³ TWA, respirable particulates; 15 mg/m³ TWA total dust

9. Physical and Chemical Properties

Physical state	Liquid
Appearance	Heavy cream
Color	Beige
Odor	Odorless
Odor threshold	Not applicable
Specific gravity	Approximately 1.4
pH	Not applicable
Viscosity, Brookfield	20,000 cps.
Freezing point	32 F. (water)
Solubility in water	Miscible
Octanol/water partition coefficient	Not available
Vapor pressure @ 25 C	Not available
Vapor density (air=1)	Not available
Evaporation rate (butyl acetate=1)	Not applicable
Boiling point, 760 mm Hg	212 F. (water)

10. Stability and Reactivity

Normally stable as defined in NFPA 704-12(4-3.1).

Incompatibilities:

Acids.

Decomposition products may include:

None known to Borden.

Hazardous polymerization:

Will not occur.

Other Hazards:

Keep away from chemically active metals: sodium, potassium, calcium, powdered aluminum, zinc, magnesium.

11. Toxicological Information

See Section 3 Hazards Identification information.
Kaolin 1332-58-7
LC50: Not available
LD50: Not available

Sodium Silicate 1344-09-8
LC50: Not available
LD50: Not available

12. Ecological Information

Not determined.

13. Disposal Considerations

Dispose of according to local, state/provincial, and federal requirements.

14. Transport Information

14.1 U.S. Department of Transportation (DOT)

The data provided in this section is for information only and may not be specific to your package size. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

Non-Regulated

14.2 Canadian Transportation of Dangerous Goods (TDG)

Finished Goods
Non-regulated

15. Regulatory Information (Selected Regulations)

15.1 U.S. Federal Regulations

OSHA Hazard Communication Standard 29CFR1910.1200

This material is a "health hazard" and/or a "physical hazard" as determined when reviewed according to the requirements of the Occupational Safety and Health Administration 29 CFR Part 1910.1200 "Hazard Communication" Standard.

SARA Title III: Section 311/312

Immediate health hazard
Delayed health hazard

SARA Title III Section 313 and 40 CFR Part 372

This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.

None required per SARA TITLE III SECTION 313.

TSCA Section 8(b) Inventory

All reportable chemical substances are listed on the TSCA Inventory. We rely on certifications of compliance from our suppliers for chemical substances not manufactured by Borden.

15.2 Canadian Regulations

Workplace Hazardous Materials Information System (WHMIS)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR) and the MSDS contains all the information required by the CPR.

CLASS D, DIV 2B

Canadian Environmental Protection Act (CEPA)

All reportable chemical substances are listed on the Domestic Substances List (DSL) or otherwise comply with CEPA new substance notification requirements.

National Pollutant Release Inventory (NPRI)

This product contains the following chemical(s) subject to the reporting requirements of the Canadian Environmental Protection Act (CEPA) subsection 16(1), National Pollutant Release Inventory.

None required.

15.3 State Regulations

Pennsylvania Worker & Community RTK Act (Pa. Act 1984-1159)

The listing of a chemical does not necessarily indicate it is hazardous.

.alpha.-D-Glucopyranoside, .beta.-D-Fructofuranosyl	57-50-1
Kaolin	1332-58-7
Sodium Silicate	1344-09-8
Water	7732-18-5

16. Other Information

User's Responsibility

The OSHA Hazard Communication Standard 29CFR 1910.1200 and the Workplace Hazardous Materials Information System (WHMIS) require that the information contained on these sheets be made available to your workers. Educate and train your workers regarding OSHA and WHMIS precautions. Instruct your workers to handle this product properly. Consult with appropriate experts to guard against hazards associated with use of this product and its ingredients.

Disclaimer

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE, except that the product shall conform to contracted specifications, and that the product does not infringe any valid United States or Canadian patent. No claim of any kind shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

CUR ISSUE 27-AUG-99
PREVIOUS ISSUE: 03-APR-98

PRINT DATE: March 12, 2001 12:40 PM

MATERIAL SAFETY DATA SHEET

FOR INDUSTRIAL USE ONLY

293

1. Chemical Product and Company Identification

DESCRIPTION: Nix-Stix™ 46
PRODUCT CODE: 78-7333.-.
PRODUCT TYPE: Release Agent
APPLICATION: Foundry Release Agent/Parting Compound

Manufacturer/Supplier Information

MSDS Prepared by:
Borden Chemical, Inc.
1401 Circle Avenue
Forest Park, IL 60130-2611

Emergency Phone Number
Poison Control Center
1-800-228-5635 ext 261

For additional health, safety or regulatory information, call 708-524-3412.

2. Composition, Information on Ingredients

The ingredients listed below have been associated with one or more immediate and/or delayed(*) health hazards. Risk of damage and effects depends upon duration and level of exposure. BEFORE USING, HANDLING, OR EXPOSURE TO THESE INGREDIENTS, READ AND UNDERSTAND THE MSDS.

	% by weight
*Amine Functional Silicone	50-70

3. Hazards Identification

3.1 Emergency Overview

Appearance	Opaque white liquid
Odor	Mild

Not a significant fire hazard.

HMIS Rating

HEALTH = 1 (slight)
FLAMMABILITY = 0 (minimal)
REACTIVITY = 0 (minimal)
CHRONIC = *

3.2 Potential Health Effects

Immediate Hazards

INGESTION: Not expected to be harmful under normal conditions of use.

INHALATION: Not expected to be harmful under normal conditions of use. However, if allowed to become airborne, may cause irritation of nose, throat and lungs.

SKIN: May cause irritation on prolonged or repeated contact.

EYES: May cause irritation on prolonged or repeated contact.

Delayed Hazards

Amine Functional Silicone
May cause allergic skin reaction.
-- See Footnote C.

Footnote C: As of the date of issuance of this document, this material has not been listed by NTP, classified by IARC nor regulated by OSHA as a carcinogen.

4. First Aid Measures

INGESTION: If accidentally swallowed, dilute by drinking large quantities of water. Immediately contact poison control center or hospital emergency room for any other additional treatment directions.

INHALATION: Remove to fresh air.

SKIN: In case of irritation, flush with water.

EYES: Immediately flush eyes with plenty of water. Call a physician if irritation persists.

5. Fire Fighting Measures

Flash point	>100C (212F) PMCC
Lower explosion limit	Not available
Upper explosion limit	Not available
Autoignition temperature	Not available

Will not burn.
In case of fire, water should be used to keep fire-exposed containers cool.

6. Accidental Release Measures

Large quantities: Enclose with diking material to prevent seepage into natural bodies of water, then consult Borden, Inc. Small quantities: Soak up with absorbent material and remove to a chemical disposal area.

7. Handling and Storage

7.1 Handling

Handle in accordance with good industrial hygiene and safety practices. These practices include avoiding unnecessary exposure and removal of the material from eyes, skin and clothing.
Wash thoroughly after handling.
INHALATION: Avoid prolonged or repeated breathing of vapor.
SKIN: Avoid prolonged or repeated contact with skin and clothing.
EYES: Avoid prolonged or repeated contact with eyes.

7.2 Storage

Keep container closed.
Keep from freezing.
Empty container may contain product residues. DO NOT cut, torch or reuse without commercial cleaning.
Do not store outside.
Store at ambient temperature.
Use with adequate ventilation.

8. Exposure Controls/Personal Protection

8.1 Exposure Controls

If airborne contaminants are generated when the material is heated or handled, sufficient ventilation in volume and air flow patterns should be provided to keep air contaminant concentration levels below acceptable criteria.

8.2 Personal Protection

Use goggles if contact is likely. Wear impervious gloves as required to prevent skin contact.

8.3 Exposure Guidelines

Amine Functional Silicone
ACGIH TLV: NONE ESTABLISHED
OSHA PEL: NONE ESTABLISHED

9. Physical and Chemical Properties

Appearance	Opaque white liquid
Odor	Mild
Odor threshold	Not available
Specific gravity	0.990-1.000
pH	9.0-11.0
Viscosity, Brookfield	Not available
Freezing point	Not available
Solubility in water	100%
Octanol/water partition coefficient	Not available
Vapor pressure @ 25 C	Similar to water
Vapor density (air=1)	>1.0
Evaporation rate (butyl acetate=1)	Not available
Boiling point, 760 mm Hg	~100C (212F)

10. Stability and Reactivity

Normally stable as defined in NFPA 704-12(4-3.1).

Incompatibilities:

None known to Borden.

Decomposition products may include:

Oxides of carbon.

Hazardous polymerization:

Will not occur.

Other Hazards:

None known to Borden.

11. Toxicological Information

See Section 3 Hazards Identification information.
Amine Functional Silicone
LC50: Not available
LD50: Not available

12. Ecological Information

Not determined.

13. Disposal Considerations

Recover free liquid. Absorb residue and dispose of according to local, state/provincial, and federal requirements.

14. Transport Information

14.1 U.S. Department of Transportation (DOT)

The data provided in this section is for information only and may not be specific to your package size. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

Non-Regulated

14.2 Canadian Transportation of Dangerous Goods (TDG)

Non-Regulated.

15. Regulatory Information (Selected Regulations)

15.1 U.S. Federal Regulations

OSHA Hazard Communication Standard 29CFR1910.1200

This material presents possible health hazards as determined when reviewed according to the requirements of the Occupational Safety and Health Administration 29 CFR Part 1910.1200 "Hazard Communication" Standard.

SARA Title III: Section 311/312

Delayed health hazard

SARA Title III Section 313 and 40 CFR Part 372

This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.

None required per SARA TITLE III SECTION 313.

TSCA Section 8(b) Inventory

All reportable chemical substances are listed on the TSCA Inventory. We rely on certifications of compliance from our suppliers for chemical substances not manufactured by Borden.

15.2 Canadian Regulations

Workplace Hazardous Materials Information System (WHMIS)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR) and the MSDS contains all the information required by the CPR.

CLASS D, DIV 2B

Canadian Environmental Protection Act (CEPA)

All reportable chemical substances are listed on the Domestic Substances List (DSL) or otherwise comply with CEPA new substance notification requirements.

National Pollutant Release Inventory (NPRI)

This product contains the following chemical(s) subject to the reporting requirements of the Canadian Environmental Protection Act (CEPA) subsection 16(1), National Pollutant Release Inventory.

None required.

15.3 State Regulations

Pennsylvania Worker & Community RTK Act (Pa. Act 1984-1159)

The listing of a chemical does not necessarily indicate it is hazardous.

Water 7732-18-5
Amine Functional Silicone

16. Other Information

User's Responsibility

The OSHA Hazard Communication Standard 29CFR 1910.1200 and the Workplace Hazardous Materials Information System (WHMIS) require that the information contained on these sheets be made available to your workers. Educate and train your workers regarding OSHA and WHMIS precautions. Instruct your workers to handle this product properly. Consult with appropriate experts to guard against hazards associated with use of this product and its ingredients.

Disclaimer

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE, except that tho product shall conform to contracted specifications, and that the product does not infringe any valid United States or Canadian patent. No claim of any kind shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller

Disclaimer

be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

CUR ISSUE 17-JAN-01
PREVIOUS ISSUE: 05-JUN-00

Material Safety Data Sheet 35

JUN 2012

1. Chemical product and company identification

Product name	Castrol Air Line & Tool Oil
MSDS #	460255
Code	460255-US06
Product use	Lubricant For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Manufacturer	BP Lubricants USA Inc. 1500 Valley Road Wayne, NJ 07470 Telephone: (973) 633-2200 Telecopier: (973) 633-7475
EMERGENCY HEALTH INFORMATION:	1 (800) 447-8735 Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY SPILL INFORMATION:	1 (800) 424-9300 CHEMTREC (USA)
OTHER PRODUCT INFORMATION	1 (866) 4 BP - MSDS (866-427-6737 Toll Free - North America) email: bpcares@bp.com

2. Composition/information on ingredients

Ingredient name	CAS #	%
Base oil - highly refined	64742-54-7	95 - 100

3. Hazards identification

Physical state	Liquid.
Color	Not available.
Emergency overview	CAUTION! MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.
Routes of entry	Dermal contact. Eye contact. Inhalation. Ingestion.
Potential health effects	
Eyes	May cause eye irritation.
Skin	May cause skin irritation. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.
Inhalation	May cause respiratory tract irritation.
Ingestion	Ingestion may cause gastrointestinal irritation and diarrhea.

Medical conditions aggravated by over-exposure	None identified.

See toxicological information (section 11).

4. First aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin contact	Immediately wash exposed skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear. If large quantities of this material are swallowed, call a physician immediately.

5. Fire-fighting measures

Flammability of the product	May be combustible at high temperature.
Flash point	210 °C (Open cup) Cleveland.
Products of combustion	carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)
Unusual fire/explosion hazards	Non-explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and shocks and mechanical impacts.
Fire-fighting media and instructions	In case of fire, use water fog, foam, dry chemicals, or carbon dioxide. Do not use water jet.
Protective clothing (fire)	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

6. Accidental release measures

Personal precautions	Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (See Section: "Exposure controls/personal protection"). Follow all fire fighting procedures (See Section: "Fire-fighting measures").
Environmental precautions and clean-up methods	If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Avoid contact of spilled material with soil and prevent runoff entering surface waterways. See Section 13 for Waste Disposal Information.
Personal protection in case of a large spill	Chemical splash goggles. Chemical resistant protective suit. Boots. Chemical resistant gloves. Vapor respirator or a self-contained breathing apparatus. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. CAUTION: The protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are not known, or if concentrations exceed the protection limits of air-purifying respirator.

7. Handling and storage

Handling	Avoid contact with skin and clothing. Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Use only with adequate ventilation Avoid breathing vapor or mist. Wash thoroughly after handling.

Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area. Empty containers may contain harmful, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
Base oil - highly refined	**ACGIH (United States).** TWA: 5 mg/m³ 8 hour(s). Form: Oil mist, mineral STEL: 10 mg/m³ 15 minute(s). Form: Oil mist, mineral **OSHA (United States).** TWA: 5 mg/m³ 8 hour(s). Form: Oil mist, mineral

Some states may enforce more stringent exposure limits.

Control Measures	Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are close to the work-station location.
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
Personal protection	
Eyes	Avoid contact with eyes. Chemical splash goggles.
Skin and body	Avoid contact with skin and clothing. Wear suitable protective clothing.
Respiratory	Use only with adequate ventilation. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable.
Hands	Wear gloves that cannot be penetrated by chemicals or oil. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions. Consult your supervisor or S.O.P. for special handling directions

Consult local authorities for acceptable exposure limits.

9. Physical and chemical properties

Physical state	Liquid.
Heat of combustion	Not available.
Pour Point	-36 °C
Specific gravity	0.861
Solubility	insoluble in water.
Viscosity	Kinematic: 32.5 mm²/s (32.5 cSt) at 40°C Kinematic: 5.85 mm²/s (5.85 cSt) at 100°C
Viscosity Index	127

10. Stability and reactivity

Stability and reactivity	The product is stable.
Conditions to avoid	Keep away from heat, sparks and flame.
Incompatibility with various substances	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)
Hazardous polymerization	Will not occur.

11. Toxicological information

Chronic toxicity

Carcinogenic effects	No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH or the International Agency for Research on Cancer (IARC). No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).
Mutagenic effects	No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a mutagen.
Reproductive effects	No component of this product at levels greater than or equal to 0.1% is classified by established regulatory criteria as a reproductive toxin.
Teratogenic effects	No component of this product at levels greater than 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

12. Ecological information

Ecotoxicity

No testing has been performed by the manufacturer.

13. Disposal considerations

Waste information	Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Dispose of in accordance with all applicable local and national regulations.

Consult your local or regional authorities.

14. Transport information

Not classified as hazardous for transport (DOT, TDG, IMO/IMDG, IATA/ICAO)

15. Regulatory information

U.S. Federal regulations	**United States inventory (TSCA 8b):** All components are listed or exempted. This product is not regulated under Section 302 of SARA and 40 CFR Part 355. **SARA 311/312 MSDS distribution - chemical inventory - hazard identification:** Castrol Air Line & Tool Oil: Immediate (Acute) Health Hazard
SARA 313	

Form R - Reporting requirements	This product does not contain any hazardous ingredients at or above regulated thresholds.
Supplier notification	This product does not contain any hazardous ingredients at or above regulated thresholds.
	CERCLA Sections 102a/103 Hazerdous Substances (40 CFR Part 302.4):: This material is not regulated under CERCLA Sections 103 and 107.
State regulations	
Massachusetts Substances	**Massachusetts RTK**: None of the components are listed.
New Jersey Hazardous Substances	**New Jersey Hazardous Substances**: None of the components are listed.
Pennsylvania RTK Hazardous Substances	**Pennsylvania RTK**: None of the components are listed.
	California Prop 65: No products were found
Inventories	**Canada Inventory:** All components are listed or exempted.
	Europe Inventory: All components are listed or exempted.
	Australian Inventory Status: All components are listed or exempted.
	China Inventory (IECSC): All components are listed or exempted.
	Japan Inventory (ENCS): All components are listed or exempted.
	Korea Inventory (KECI): All components are listed or exempted.
	Philippines Inventory (PICCS): All components are listed or exempted.

16. Other information

Label requirements	CAUTION! MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION.
HMIS® Rating :	**Health** 1 **Flammability** 1 **Physical Hazard** 0 **Personal protection** X
	National Fire Protection Association (U.S.A.)

History	
Date of issue	03/22/2007.
Date of previous issue	No Previous Validation.
Prepared by	Product Stewardship
Notice to reader	

NOTICE : This Material Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. Despite our efforts, it may not be up to date or applicable to the circumstances of any particular case. We are not responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product.

Material Safety Data Sheet

307

JUN 2012

1. Chemical product and company identification

Product name	Castrol Paradene 22 R&O
MSDS #	459058
Historic MSDS #:	None.
Code	459058-US06
Product use	Hydraulic fluid For specific application advice see appropriate Technical Data Sheet or consult our company representative.
Manufacturer	BP Lubricants USA Inc. 1500 Valley Road Wayne, NJ 07470 Telephone: (973) 633-2200 Telecopier: (973) 633-7475
EMERGENCY HEALTH INFORMATION:	1 (800) 447-8735 Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY SPILL INFORMATION:	1 (800) 424-9300 CHEMTREC (USA)
OTHER PRODUCT INFORMATION	1 (866) 4 BP - MSDS (866-427-6737 Toll Free - North America) email: bpcares@bp.com

2. Composition/information on ingredients

Ingredient name	CAS #	%
Base oil - highly refined	Mixture	0 - 100

3. Hazards identification

Physical state	Liquid.
Color	Amber. [Light]
Emergency overview	CAUTION! MAY CAUSE EYE IRRITATION. MAY CAUSE SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.
Routes of entry	Dermal contact. Eye contact. Inhalation. Ingestion.
Potential health effects	
Eyes	May cause eye irritation.
Skin	May cause skin irritation. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis. High pressure skin injections are serious medical emergencies. Injury will not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful.

RHS057

Inhalation	May cause respiratory tract irritation.
Ingestion	Ingestion may cause gastrointestinal irritation and diarrhea.
Medical conditions aggravated by over-exposure	None identified.

See toxicological information (section 11).

4. First aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin contact	Immediately wash exposed skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately. Accidental high pressure injection through the skin requires immediate medical attention.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear. If large quantities of this material are swallowed, call a physician immediately.

5. Fire-fighting measures

Flammability of the product	May be combustible at high temperature.
Flash point	205 °C (Open cup) Cleveland.
Products of combustion	carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)
Unusual fire/explosion hazards	This material is not explosive as defined by established regulatory criteria.
Fire-fighting media and instructions	In case of fire, use water fog, foam, dry chemicals, or carbon dioxide. Do not use water jet.
Protective clothing (fire)	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

6. Accidental release measures

Personal precautions	Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (See Section: "Exposure controls/personal protection"). Follow all fire fighting procedures (See Section: "Fire-fighting measures").
Environmental precautions and clean-up methods	If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Avoid contact of spilled material with soil and prevent runoff entering surface waterways. See Section 13 for Waste Disposal Information.
Personal protection in case of a large spill	Chemical splash goggles. Chemical resistant protective suit. Boots. Chemical resistant gloves. Vapor respirator or a self-contained breathing apparatus. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. CAUTION: The protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are not known, or if concentrations exceed the protection limits of air-purifying respirator.

7. Handling and storage

Handling	Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Use only with adequate ventilation. Wash thoroughly after handling. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area. Empty containers may contain harmful, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

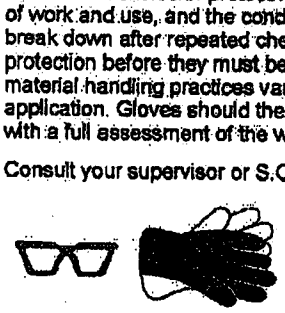
8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
Base oil - highly refined	**ACGIH (United States).** STEL: 10 mg/m³ 15 minute(s). Form: Oil mist, mineral TWA: 5 mg/m³ 8 hour(s). Form: Oil mist, mineral **OSHA (United States).** TWA: 5 mg/m³ 8 hour(s). Form: Oil mist, mineral

Some states may enforce more stringent exposure limits.

Control Measures	Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are close to the work-station location.
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
Personal protection	
Eyes	Avoid contact with eyes. Chemical splash goggles.
Skin and body	Avoid contact with skin and clothing. Wear suitable protective clothing.
Respiratory	Use only with adequate ventilation. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable.
Hands	Wear gloves that cannot be penetrated by chemicals or oil. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions. Consult your supervisor or S.O.P. for special handling directions



Consult local authorities for acceptable exposure limits.

9. Physical and chemical properties

Physical state	Liquid.
Odor	Oily [Slight]
Color	Amber. [Light]
Heat of combustion	Not available.

Pour Point	-28 °C
Specific gravity	0.849
Solubility	Insoluble in water.
Viscosity	Kinematic: 22.3 mm^2/s (22.3 cSt) at 40°C Kinematic: 4.3 mm^2/s (4.3 cSt) at 100°C SUS: 40.6 SUS at 98.889°C
Viscosity Index	105

10. Stability and reactivity

Stability and reactivity	The product is stable.
Conditions to avoid	Keep away from heat, sparks and flame.
Incompatibility with various substances	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)
Hazardous polymerization	Will not occur.

11. Toxicological information

Chronic toxicity

Carcinogenic effects	No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH or the International Agency for Research on Cancer (IARC). No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).
Mutagenic effects	No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a mutagen.
Reproductive effects	No component of this product at levels greater than or equal to 0.1% is classified by established regulatory criteria as a reproductive toxin.
Teratogenic effects	No component of this product at levels greater than 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

12. Ecological information

Ecotoxicity

No testing has been performed by the manufacturer.

13. Disposal considerations

Waste information	Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify *spilled or contaminated materials as hazardous waste.* Use only approved transporters, recyclers, treatment, storage or disposal facilities. Dispose of in accordance with all applicable local and national regulations.
RCRA Waste Code(s)	USED OIL

Consult your local or regional authorities.

14. Transport information

Not classified as hazardous for transport (DOT, TDG, IMO/IMDG, IATA/ICAO)

15. Regulatory information

U.S. Federal regulations

United States inventory (TSCA 8b): All components are listed or exempted.

TSCA 12(b) one-time export notification:: Diphenylamine

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Castrol Paradene 22 R&O: Immediate (Acute) Health Hazard

SARA 313

Form R - Reporting requirements: This product does not contain any hazardous ingredients at or above regulated thresholds.

Supplier notification: This product does not contain any hazardous ingredients at or above regulated thresholds.

CERCLA Sections 102a/103 Hazardous Substances (40 CFR Part 302.4):: This material is not regulated under CERCLA Sections 103 and 107.

State regulations

Massachusetts Substances: **Massachusetts RTK:** None of the components are listed.

New Jersey Hazardous Substances: **New Jersey Hazardous Substances:** None of the components are listed.

Pennsylvania RTK Hazardous Substances: **Pennsylvania RTK:** None of the components are listed.

WARNING: This product contains a chemical known to the State of California to cause cancer.
2-Naphthylamine; Aniline

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
Toluene

Inventories

Canada inventory: All components are listed or exempted.

Europe inventory: All components are listed or exempted.

Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory (ENCS): At least one component is not listed.

Korea inventory (KECI): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

16. Other information

Label requirements

CAUTION!

MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

HMIS® Rating :

Health	1
Flammability	1
Physical Hazard	0

National Fire Protection Association (U.S.A.)

RHS061

Personal protection	**X**

History

Date of issue	07/27/2007.
Date of previous issue	No Previous Validation.
Prepared by	Product Stewardship

Notice to reader

NOTICE : This Material Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. Despite our efforts, it may not be up to date or applicable to the circumstances of any particular case. We are not responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product.

MATERIAL SAFETY DATA SHEET

Date Issued: 12/27/02

SECTION A - IDENTIFICATION & EMERGENCY INFORMATION

Manufacturer's Name: Castrol Heavy Duty Lubricants Inc.
Emergency Telephone Number: 410-574-5000
800-777-1466

Address: 9300 Pulaski Highway
Baltimore, MD 21220

PRODUCT NAME: Paradene AW Hydraulics Oil
22 AW, 32 AW, 46 AW, 68 AW, 100 AW, 150 AW, 220 AW, 320 AW, and 460 AW

Part Number: 4011, 4021, 4031, 4041, 4051
4061, 4071, 4091, 4101

Chemical Family: Petroleum Oil (Hydraulic Oil)
Product Appearance & Odor: Clear Light Amber Color
Mild Petroleum Hydrocarbon Odor

CAS Number (For Finished Product):
COMPLEX MIXTURE
CAS Number Not Applicable

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)
Health - 1 Flammability - 1 Reactivity - 0
Hazard Rating: Least-0 Slight-1 Moderate-2 High-3 Extreme-4

SECTION B - COMPONENTS & HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Lubricating Oil Base Stock	64742-6500	Greater than 85%
Proprietary Additives	Mixture	Less than 15%

Exposure Limit for Total Product: 5mg/m³ oil mist for an 8-hour workday. Basis: OSHA Reg. 29 CFR 1910.1000
CERLA Hazardous Substances: None known. If this product is accidentally spilled, it is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). We recommend you contact local authorities to determine if there may be other local reporting requirements. US TSCA Inventory: All components of this material are on the US TSCA Inventory. Threshold Planning Quantity (TPQ), EPA Regulation 40 CFR 355 Extremely Hazardous Substances (SARA Sections 301-304): None. Toxic Chemical Release Reporting, EPA Regulation 40 CFR 372 (SARA Section 313): Not Applicable.

SECTION C - PHYSICAL DATA (THE FOLLOWING DATA ARE APPROXIMATE OR TYPICAL VALUES.)

Boiling Range: Not Determined
Specific Gravity (H_2O=1): .8500/.8900
Pour Point: -32°C/-7°C
Viscosity: 100°C cSt 4.4/32.0
Solubility in Water: Negligible, less than 0.1%

Percent Volatile by Volume: NEGLIGIBLE
Vapor Pressure: NEGLIGIBLE
Vapor Density: GREATER THAN AIR
Evaporation Rate: NEGLIGIBLE

SECTION D - FIRE PROTECTION INFORMATION

FLASH POINT & METHOD: Min. ASTM D-92 C.O.C. °C, (°F.)
205 (401) / 260 (500)

AUTO IGNITION TEMPERATURE:
Not Determined

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)-Hazard Identification
Health - 1
Flammability - 1
Reactivity - 0
Basis: Recommended by Castrol Heavy Duty Lubricants Inc.
Hazard Rating (NFPA):
4-Extreme 3-High 2-Moderate
1-Slight 0-Insignificant

UNUSUAL FIRE & EXPLOSION HAZARDS:

None

Flammability Limits (% by volume in air):
Lower: Not determined Upper: Not determined

SECTION D - FIRE PROTECTION INFORMATION (Continued)

HANDLING PRECAUTIONS: Use product with caution around heat, sparks, pilot lights, static electricity and open flame.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS: Fumes, smoke, carbon monoxide, sulfur oxides, and other decomposition products, in the case of incomplete combustion.

EXTINGUISHING MEDIA & FIRE FIGHTING PROCEDURES: Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on the size or potential size of fire and circumstances related to the situation. Plant fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Associations' *Fire Protection Guide on Hazardous Materials*. Use water spray, dry chemical, foam, or carbon dioxide to extinguish the fire. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

EMPTY CONTAINER WARNING: "Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION: THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION E - PROTECTION & PRECAUTIONS

VENTILATION: Use local exhaust to capture vapor, mists or fumes, if necessary. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, flame or other ignition sources.

RESPIRATORY PROTECTION: Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES: Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION: Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT: Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS: Keep containers closed when not is use. Do not store near heat, sparks, flame or strong oxidants. In order to prevent fire or explosion hazards, use appropriate equipment.

PERSONAL HYGIENE: Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed skin by waterless hand cleaners followed by washing thoroughly with soap and water.

VARIABILITY AMONG INDIVIDUALS: Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks, which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

SECTION F- SPILL OR LEAK PROCEDURE

ENVIRONMENTAL IMPACT: Report spills as required to the appropriate authorities. US Coast Guard Regulations require immediate reporting of spills that could reach any waterway including intermittent dry creeks. Report spill to the Coast Guard toll free number 800-424-8802.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: Recover free product. Add sand, earth, or other suitable absorbent material to the spill area. Minimize breathing vapors. Minimize skin contact. Keep product out of sewers and watercourses by dicing or impounding. Advise authorities if the product has entered or may enter sewers, watercourses, or extensive land areas. ASSURE CONFORMITY WITH ALL APPLICABLE REGULATIONS.

WASTE DISPOSAL: Dispose of in an environmentally safe manner and in accordance with all government regulations to include Federal, State, and local requirements.

SECTION G - REACTIVITY

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS & MATERIALS TO AVOID: Avoid heat, open flames and oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition products are highly dependent on the combustion conditions. A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes combustion. Carbon monoxide and other unidentified organic compounds may be formed upon combustion.

SECTION H - EMERGENCY & FIRST AID PROCEDURES AND PRIMARY ROUTES OF ENTRY

EYE CONTACT: If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritations persist, call a physician. **SKIN CONTACT:** In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INGESTION: If ingested, DO NOT induce vomiting; call a physician immediately.

INHALATION: Vapor pressure is very low. Vapor inhalation under ambient temperature conditions is not normally a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. Administer oxygen, if available. If over-exposed to oil mist, remove from further exposure until excessive mist oil condition subsides.

SECTION I - EFFECTS OF OVEREXPOSURE

SKIN: Prolonged or repeated skin contact may cause skin irritation. **EYE:** May cause eye irritation. **INGESTION:** Relatively nontoxic.

SECTION J - TRANSPORTATION INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT) - DOT Identification Number: Not Regulated.

THE PRECISE COMPOSITION OF THIS MIXTURE IS PROPRIETARY INFORMATION. A MORE COMPLETE DISCLOSURE WILL BE PROVIDED TO A PHYSICIAN OR NURSE IN THE EVENT OF A MEDICAL EMERGENCY.

For help in a chemical emergency, call Chemtrec at 1-800-424-9300

443

terial Safety Data Sheet
May be used to comply with
OSHA's Hazard Communication Standard
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(NON-MANDATORY FORM)
Form Approved
OMB No. 1218-0072

Identity (As Used on Label and List)
Tecpro Coating W12

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name: Tecpro Corporation	***Emergency Telephone Number:*** (404) 691-7213
Address: (Number, Street, City, State, and ZIP Code)	***Telephone Number for Information:*** (404) 691-7213
3555 Atlanta Industrial Parkway	***Date Prepared:*** 03/13/00
Atlanta, GA 30331	***Signature of Preparer: (optional)***

Section II - Hazardous Ingredients/Identity Information

Hazardous Components(Specific Chemical Identity; Common Name(s))	***OSHA PEL***	***ACGIH TLV***	***Other Limits Recommended***	***% (optional)***
Not Applicable				

Section III - Physical/Chemical Characteristics

Boiling Point (water)	212 °F	***Specific Gravity (H_2O=1)***		1.34 - 1.42 g/cm³
Vapor Pressure (mm Hg)	NA	***Melting Point***		NA
Vapor Density (AIR=1)	NA	***Evaporation Rate (Butyl Acetate=1)***		NA

Solubility in Water: Dispersed

Appearance and Odor: Heavy, light grey liquid, no odor.

Section IV - Fire and Explosion Hazard Data

Flash Point: (Method Used)	NA	***Flammable Limits:***	NA	LEL: NA	UEL: NA

Extinguishing Media: None

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

Product: Tecpro Coating W12

Section V - Reactivity Data

Stability	Unstable		Conditions to Avoid:
	Stable	X	None known

Incompatibility: (Materials to Avoid) None

Hazardous Decomposition or Byproducts: None

Hazardous Polymerization	May Occur		Conditions to Avoid:
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry: Inhalation? Yes Skin? Yes Ingestion? Yes

Health Hazards: (Acute and Chronic) None

Carcinogenicity:	NTP? No	IARC Monographs? No	OSHA Regulated No

Signs and Symptoms of Exposure: None

Medical Conditions Generally Aggravated by Exposure:	None

Emergency and First Aid Procedures: EYES: Flush with water for 15 min., get medical attention. Skin: Wash with soap & water. INHALATION: Remove victim to fresh air & provide oxygen if breathing is difficult. INGESTION: Give victim 2 glasses of water & induce vomiting, get medical attention.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: Pick up spills with sand or other absorbent material; place in sealable drums. Wash away excess with water.

Waste Disposal Method: Follow federal, state and local regulations.

Precautions to Be Taken in Handling and Storing: Do not allow product to freeze.

Other Precautions: None

Section VIII - Control Measures

Respiratory Protection: (Specify Type) Not required.

Ventilation	Local Exhaust: Suggested when spraying	Special: None	
	Mechanical: (General) None	Other: None	
Protective Gloves: Rubber gloves when handling.		Eye Protection: Safety glasses with side shields.	

Other Protective Clothing or Equipment: Avoid getting on clothes.

Work/Hygienic Practices: When working with product, do not drink, eat or smoke before using good housekeeping measures.

For Help in a chemical emergency, call Chemtrec – 1-800-424-9300

Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act and shall not be used for any other purpose. Use or dissemination of all or any part of this information for any other purpose may result in a violation of law or constitute grounds for legal action.

HMIS Labeling	
Health	0
Flammability	0
Reactivity	0
Personal Protection	B

NA = not applicable

REV. DATE - 2/12/04
PRINT DATE - 2/10/12

SLAG-OFF

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

GENERIC NAME: PERLITE (ORE)
CHEMICAL NAME: AMORPHOUS ALUMINA SILICATE
FORMULA: MIXTURE
COMPANY NAME: CONESTOGA FOUNDRY SUPPLY CO.
ADDRESS: P.O. BOX 464
CITY: HAMBURG **STATE:** PA **ZIP:** 19526

CAS: 130885-09-5
EINECS: UNKNOWN

PHONE: (610)562-3836
FAX: (610)562-0726
EMERGENCY: CHEMTREC (800)424-9300 CONT. U.S.

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS NUMBER:	%	PEL AND TLV (except as noted)
PERLITE (AMORPHOUS ALUMINA SILICATE)	130885-09-5	100	5 mg/M^3 RESPIRABLE NUISANCE DUS, OSHA 10 mg/M^3 TOTAL NUISANCE DUST, ACGIH

3. HAZARD IDENTIFICATION

SUMMARY: PROLONGED AND REPEATED EXPOSURE TO EXCESSIVE CONCENTRATIONS OF THIS PRODUCT'S DUST, OR ANY NUISANCE DUST, CAN CAUSE CHRONIC PULMONARY DISEASE. DUST CONTACT WITH EYES MAY CAUSE TEMPORARY SCRATCHINESS OR REDNESS. THIS PRODUCT HAS NOT BEEN CLASSIFIED AS A CARCINOGEN BY NTP OR IARC.

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED: PRE-EXISTING UPPER RESPIRATORY AND LUNG DISEASE SUCH AS, BUT NOT LIMITED TO, BRONCHITIS, EMPHYSEMA AND ASTHMA.
TARGET ORGAN(S): LUNGS, EYES

ACUTE HEALTH EFFECTS: TRANSITORY UPPER RESPIRATORY OR EYE IRRITATION.
CHRONIC HEALTH EFFECTS: PROLONGED AND REPEATED EXPOSURES TO EXCESSIVE CONCENTRATIONS OF PRODUCT DUST, IN EXCERSS OF THE PEL/TLV, CAN CAUSE CHRONIC PULMONARY DISEASE.

PRIMARY ENTRY ROUTE(S): INHALATION, DUST CONTACT WITH EYES.
INHALATION: IRRITATION OR SORENESS IN THROAT & NOSE, IN EXTREME EXPOSURES SOME CONGESTION MAY OCCUR.
EYES: TEMPORARY IRRITATION OR INFLAMMATION.
SKIN CONTACT: NA **SKIN ABSORPTION:** NA **INGESTION:** NOT HAZARDOUS WHEN INGESTED.

4. FIRST AID MEASURES

INHALATION: REMOVE TO FRESH AIR. DRINK WATER TO CLEAR THROAT AND BLOW NOSE TO EVACUATE DUST.
EYES: FLUSH EYES WITH LARGE QUANTITIES OF WATER. IF IRRITATION PERSISTS CONSULT A PHYSICIAN.
SKIN CONTACT: NA **SKIN ABSORPTION:** NA **INGESTION:** NA

5. FIRE FIGHTING MEASURES

FLASH POINT (METHOD): NONFLAMMABLE
NFPA FLAMMABLE/COMBUSTIBLE LIQUID CLASSIFICATION: NA
FLAMMABLE LIMITS: LEL: NA UEL: NA

AUTO-IGNITION TEMPERATURE: NA
EXTINGUISHING MEDIA: NA
UNUSUAL FIRE OR EXPLOSURE HAZARDS: NONE
SPECIAL FIRE-FIGHTING PROCEDURES: NONE

6. ACCIDENTAL RELEASE MEASURES

PROCEDURES FOR SPILL/LEAK: VACUUM CLEAN DUST WITH EQUIPMENT FITTED WITH HEPA FILTER. USE A DUST SUPPRESSANT SUCH AS WATER IF SWEEPING IS NECESSARY.

7. HANDLING AND STORAGE

MINIMIZE DUST GENERATION AND ACCUMULATION. AVOID BREATHING DUST, AVOID CONTACT WITH EYES. SEAL BROKEN BAGS IMMEDIATELY. CONTINUE TO FOLLOW ALL MSDS/LABEL WARNINGS WHEN HANDLING EMPTY CONTAINERS.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

GOGGLES: GOGGLES OR SAFETY GLASSES WITH SIDESHIELDS ARE RECOMMENDED.
GLOVES: NOT NORMALLY REQUIRED.
RESPIRATOR: <10X PEL, USE AN N95 QUARTER OR HALF MASK RESPIRATOR; <50XPEL, USE A FULL FACE RESPIRATOR EQUIPPED WITH N95 FILTERS; <200X PEL, USE A POWERED AIR PURIFYING RESPIRATOR (POSITIVE PRESSURE) WITH N95 FILTERS; >200X PEL, USE A FULL FACE, TYPE C SUPPLIED AIR RESPITATOR (CONTINUOUS FLOW MODE).
VENTILATION: USE SUFFICIENT NATURAL OR MECHANICAL VENTILATION TO KEEP DUST LEVEL BELOW PEL.
OTHER: Special considerations for repair/maintenance or contaminated equipment: INSURE PROPER RESPIRATORY PROTECTION.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: GRAY GRANULAR SOLID, NO ODOR.

BOILING POINT: NA
SPECIFIC GRAVITY (WATER = 1): 2.2 - 2.4
MELTING POINT: 1945 F
WATER SOLUBILITY (%): NEGLIGIBLE
pH: 6.5 - 7.5

EVAPORATION RATE: (=1): NA
VAPOR PRESSURE: NA
% VOLATILE BY VOLUME: NIL
VAPOR DENSITY (AIR = 1): NA

10. STABILITY AND REACTIVITY

MATERIAL IS STABLE. HAZARDOUS POLYMERIZATION CANNOT OCCUR.
CHEMICAL INCOMPATIBILITIES: HYDROFLUORIC ACID
CONDITIONS TO AVOID: NONE IN DESIGNED USE.

11. TOXICOLOGICAL INFORMATION

SUMMARY: PROLONGED AND REPEATED EXPOSURE TO EXCESSIVE CONCENTRATIONS OF THIS PRODUCT'S DUST, OR ANY NUISANCE DUST, CAN CAUSE CHRONIC PULMONARY DISEASE. DUST CONTACT WITH EYES MAY CAUSE TEMPORARY SCRATCHNINESS OR REDNESS. THIS PRODUCT HAS NOT BEEN CLASSIFIED AS A CARCINOGEN BY NTP OR IARC.

12. ECOLOGICAL INFORMATION

GENERALLY CONSIDERED CHEMICALLY INERT IN THE ENVIRONMENT, USE MATERIAL WHICH HAS BECOME CONTAMINATED MAY HAVE SIGNIFCANTLY DIFFERENT CHARACTERISTICS BASED ON THE CONTAMINANT AND SHOULD BE EVALUATED ACCORDINGLY.

13. DISPOSAL CONSIDERATIONS

WASTE IS NOT HAZARDOUS AS DEFINED BY RCRA (40 CFR 261). OTHER STATE AND LOCAL REGULATIONS MAY VARY. CONSULT LOCAL AGENCIES AS NEEDED. USE MATERIAL WHICH AHS BECOME CONTAMIANTED MAY BE SIGNIFICANTLY DIFFERENT CHARACTERISTICS BASED ON THE CONTAMINANTS AND SHOULD BE EVALUATED ACCORDINGLY.

14. TRANSPORTATION INFORMATION

D.O.T. PROPER SHIPPING NAME: PERLITE CRUDE
HAZARD CLASSIFICATION: NOT CLASSIFIED
REPORTABLE QUANTITIES: NOT APPLICABLE
UN (UNITED NATIONS), NA (NORTH AMIERICA) NUMBER: NOT APPLICABLE

15. REGULATORY INFORMATION

OSHA HAZARD COMMUNICATIONS STANDARD, 29 CFR 1910, 1200: MATERIAL IS CONSIDERED HAZARDOUS, SEE SECTION 13.
RCRA: THIS MATERIAL IS NOT DEFINED AS HAZARDOUS WASTE PER 40 CFR 261.
TSCA: THIS MATERIAL IS LISTED IN THE TSCA INVENTORY, AND IS NOT OTHERWISE REGULATED BY TSCA SEC. 4, 5, 7, 7 OR 12.
CERCLA: MATERIAL IS NOT REPORTABLE UNDER CERCLA, LOCAL REQUIREMENTS MAY VARY.
SARA: 311/312 HAZARD CATEGORIES - IMMEDIATE AND DELAYED HEALTH, 313 REPORTABLE INGREDIENTS - NONE.
CANADA: THIS PRODUCT IS LISTED ON THE OSL.
CALIFORNIA PROPOSITION 65: NOT APPLICABLE.

16. OTHER INFORMATION

STORAGE SEGREGATION HAZARD CLASSES: NA
SPECIAL HANDLING/STORAGE: REPAIR ALL BROKEN BAGS IMMEDIATELY.
SPECIAL WORKPLACE ENGINEERING CONTROLS: ADEQUATE VENTILATION TO KEEP DUST LEVEL BELOW PEL.

PREPARE/REVISED BY: JAMES WOODESHICK **TITLE:** QUALITY CONTROL MANAGER

672

IGC Technologies

Material Safety Data Sheet

Section 1: Product and Company Identification

Product Name	Slag Getter 300
Product Number	N/A
Company	IGC Technologies, LLC
Address	4039 W. Green Tree Road Milwaukee, WI 53209
Technical Phone	(414) 540-1300
Fax	(414) 540-2350
Emergency Phone	CHEMTRAC (US) (800) 424-9300

Section 2: Composition and Information on Ingredients

Component	CAS Reg. Number	OSHA PEL	ACGHI TLV
Inert Filler Material		No applicable information was found	No applicable information was found
Iron III Oxide	1309-37-1	TWA 15 mg/m³ (total) TWA mg/m³ (resp)	TLV as Fe 5 mg/m³ as TWA A4
Amorphous Silica	7631-86-9	TWA 20 mppcf (80mg/m³ / %SiO2)	10 mg/m³ (resp)

Section 3: Hazards Identification

Emergency Overview	HMIS Rating	NFPA Rating
Contains amorphous silica	Health: 1*Chronic Flammability: 0 Reactivity: 0	Health: 1 Flammability: 0 Instability: 0

Section 4: First Aid Measures

Oral Exposure	Seek professional medical attention
Inhalation Exposure	If respiratory irritation or distress occurs, remove victim to fresh air. Seek professional medical attention if respiratory irritation or distress continues.
Dermal (Skin) Exposure	In case of contact, wash with soap and water. Seek professional medical attention if irritation develops or persists.
Eye Exposure	Flush with Assure adequate flushing of the eyes by holding eyelids open.

Medical Conditions Possibly Aggravated by Exposure	Pre-existing respiratory conditions

Section 5: Fire Fighting Measures

Flammable Hazard	Non-combustible	
Explosion Hazard	No hazard reported	
Flashpoint	No applicable information available	
Explosion Limits	Upper Limit: N/A	Lower Limit: N/A
Autoignition Temperature	No applicable information available	
Extinguishing Media	All extinguishing medias	
Special Fire Fighting Procedures	No applicable information available	
Specific Firefighting Hazard	No applicable information available	
Fire Fighting Protective Equipment	No applicable information available	

Section 6: Accidental Release Measures

Evacuation Procedures and Safety: No applicable information was found

Procedure to be followed in case of spill/leak: Use dust suppressant if necessary

Methods for Cleanup: Vacuum spilled substance

Procedure of Personal Precautions: P1 filter respirator for inert particles

Environmental and Regulatory Reporting: No applicable information was found

Section 7: Handling and Storage

Handling	No special handing instructions
Storage	Avoid wet conditions
Special Precautions	No special precautions

Section 8: Exposure Controls/Personal Protection

Exposure Limits: TWA 20 mppcf (80mg/m³ / %SIO□) for amorphous silica

Engineering Controls: Local exhaust or adequate ventilation

Personal Protective Equipment: Safety goggles recommended

Work Practices: Avoid vigorous shaking of bags, clean clothes with vacuum hose, avoid inhalation of dust; do not eat, drink or smoke during use

Section 9: Physical/Chemical Properties

Physical Appearance	Reddish-Brown Powder	Solubility	Negligible in water
Odor	No odor	Specific Gravity	Unknown

Section 10: Stability and Reactivity

Stability	
Stable	Stable substance, contains iron which is rapidly oxidized in damp or salty air (rust)
Conditions to avoid	No special precautions
Materials to avoid	Hydrofluoric acid, strong oxidizers, carbon monoxide

Possible Hazardous Decomposition Products: May react with hydrofluoric acid to form toxic silicon tetrafluoride gas

Possible Hazardous Polymerization: Will not occur

Section 11: Toxicological Information

Route of Exposure	Signs/Symptoms of Exposure
Dermal (Skin)	Irritation
Eye	Irritation
Ingestion	No applicable information was found
Inhalation	Irritation; in extreme conditions congestion may occur

Target Organ(s) or System(s): Eyes, skin, respiratory system

Chronic Toxicity: Inhalation of high levels of any nuisance dust over long periods of time may cause lungs to become more vulnerable to pneumoconiosis (lung disease). May contain amorphous silica, considered a carcinogen by NTP and IARC.

Section 12: Ecological Information

Ecotoxicological Information: No applicable information was found

Chemical Fate Information: No applicable information was found

Section 13: Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation: Follow appropriate local, state and federal regulations

Appropriate Method of Disposal of Contaminated Packaging: Follow appropriate local, state and federal regulations

Section 14: Transportation Information

DOT: No applicable information was found

US Department of Transport Shipping Name: No applicable information was found

Section 15: Regulatory Information

Inventory Status	
Inventory	Status
United States (TSCA)	No applicable information found
Canada (DSL)	No applicable information found
EUROPE	No applicable information found
Australia (AICS)	No applicable information found
Japan (MITI)	No applicable information found
Mexico	No applicable information found

Federal Regulations: No applicable information found

SARA Title III Hazard Classes: No applicable information found

Section 16: Other Information

Reason for Revision: Updated components
9/2007

Prepared by: R. Roti

Approved by: J. Cieplewski, R & D Manager

The information presented herein has been compiled from sources considered to be reliable and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. The user is responsible to determine for himself or herself the suitability of any material for a specific use and to adopt such safety precautions as maybe necessary. IGC Technologies LLC in no way assumes liability for any misuse of above information or product. If you need further information and/or clarification to use this material safely, please contact us.

MATERIAL SAFETY DATA SHEET

ERVIN

ERVIN INDUSTRIES, INC.
3893 RESEARCH PARK DRIVE
ANN ARBOR, MI 48108-2217
TELEPHONE: (734) 769-4600
FAX: (734) 663-0136

Revision Date: 12/5/2012	Replaces Date: 12/9/2009	Revision Level: T
PREPARED BY: Mark Hash	Ervin Industries	

SECTION I PRODUCT IDENTIFICATION

Product Name		Chemical Family
AMASTEEL SHOT	AMABRASIVE	FERROUS
AMASTEEL GRIT	(SHOT / GRIT MIX)	

SECTION II COMPOSITION / INGREDIENTS

Chemical Name	CAS Registry No	% Weight	ACGIH - TLV (mg/m^3)	OSHA - PEL (mg/m^3)
Iron - Fe	7439-89-6	>96		
Oxide fume as Fe			5	10
Carbon - C	7440-44-0	<1.2	none estab.	none estab.
Manganese - Mn	7439-96-5	<1.3		
Elemental, Inorganic Compounds as Mn			0.2	5 (ceiling)
Fume as Mn			none estab.	5 (ceiling)
Silicon - Si	7440-21-3	<1.2		
as total dust			10	15
Respirable fraction			none estab.	5
Chromium - Cr	7440-47-3	<0.25		
Elemental, Inorganic Compounds as Cr metal			0.5	1
Cr II compounds - as Cr			none estab.	0.5
Cr III compounds - as Cr			0.5	0.5
Cr VI compounds - water soluble			0.05	5 ug
Cr VI compounds - insoluble			0.01	5 ug
Chromic Acid and Chromates as CrO_3			none estab.	0.1 (ceiling)
Cr VI (hexavalent chromium) in product as shipped		**Not detected**	0.05 & 0.01	5 ug /2.5 action
Copper – Cu	7440-50-8	<0.25		
Fume			0.2	0.1
Dust & mists			1	1
Nickel - Ni	7440-02-0	<0.20		
Elemental metal			1.5	
Insoluble as Ni			0.1	1
Soluble compounds as Ni			0.2	1

SECTION III PHYSICAL DATA

Cast steel shot and grit are non-hazardous as received. Fine metallic dust is generated as the abrasive breaks down from impact and wear during normal use. Since the ferrous content is >96%, dust or fumes will consist mainly of iron or iron oxide. In addition, the fine steel dust created can be a mild explosion hazard (see section V).

Boiling Point - 2850-3150 Degrees C	Melting Point - 1371-1483 Degrees C
Specific Gravity (at 60 Degrees F) >7.6	Vapor Pressure - Not Applicable
% Volatile by Volume - Not Applicable	pH - Not Applicable
Appearance and Odor - Spherical - no odor	Percent Solid by Weight - 100%

SECTION IV REACTIVITY DATA

Stability – Stable Hazardous decomposition products – None Hazardous Polymerization - will not occur
Shot will break down into progressively smaller particles and dust during normal use.

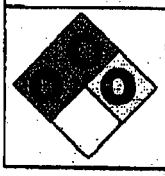
MATERIAL SAFETY DATA SHEET

ERVIN

SECTION V FIRE AND EXPLOSION HAZARD DATA

Flash Point - Not Applicable	Auto Ignition Temperature (solid iron exposed to Oxygen) -930 degree C
Flammability Limits - Not Applicable	Cast steel shot will not burn or explode

A mild fire or explosion hazard situation may be created from fine metal dust. Fire Extinguishing method for dust created due to use - use Class D extinguishing agents or dry sand to exclude air. Do not use water or other liquids, or foam.



NFPA Hazard Rating: 0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

Health (blue) = 0 Flammability (red) = 0 Reactivity (yellow) = 0 Special (colorless)

SECTION VI HEALTH HAZARD DATA

Emergency and First Aid Procedure - If inhaled, move out of area into fresh air. Flush eyes with running water, have any remaining particles removed from eyes by a qualified medical person; call 911 for immediate medical assistance.

The end user should have an industrial hygiene evaluation to determine the proper personal protective equipment for each application or blasting operation. Threshold Limit Values - Permissible Exposure Limits - see Section II

Primary Routes of entry - Inhalation of dust or dust particles in eyes. Target Organs - Lung for chromium and lung & nasal for Nickel. Metallic Nickel is reasonably anticipated to be a human carcinogen.

Over exposure to dust and fumes may cause mouth, eye, and nose irritation. Prolonged overexposure to manganese dust or fume affects the central nervous system. Prolonged overexposure to iron oxide fume can cause siderosis, or "iron pigmentation" of the lung. It can be seen on a chest x-ray but causes little or no disability.

Fumes generated by welding or flame cutting a surface containing new or used abrasive or the dust created by use of the abrasive may convert a small portion of chromium to hexavalent chromium. IARC reports welding fumes are possibly carcinogenic to humans.

SECTION VII PERSONAL PROTECTION INFORMATION

Ventilation - General ventilation and local exhaust should be provided to keep the dust levels below the limits shown in Section II.

Respiratory protection – If an industrial hygiene evaluation shows dust exceeds OSHA PEL's indicated in Section II, a NIOSH approved respirator with appropriate filters should be worn as determined by the end user.

Eye protection - Approved safety glasses w/side shields should always be worn. Other protective equipment determined by the end user.

SECTION VIII SPILL / LEAK PROCEDURES AND WASTE DETERMINATION

Shot spilled or leaked onto floors can create hazardous walking conditions. When cleaning up quantities of dust; if exceeding OSHA permissible exposure limits, an approved respirator with appropriate filters should be used.

Dust from blasting or peening operations always contain contaminants. The dust must be tested to determine if it is hazardous or non-hazardous waste. After such determination, the dust must be disposed of according to appropriate local, State or Federal regulations.

SECTION IX SPECIAL PRECAUTIONS

Precautions to be taken in handling and storing - Keep dry to reduce rusting. **Observe maximum floor loading limitations.**

SECTION X TRANSPORTATION

DOT Classification - Not a regulated material | Proper Shipping Name - N/A | DOT ID # - Not regulated

SECTION XI REGULATORY

a) **CERCLA** Hazardous Substance	_____ yes	__X__ no
b) **SARA, Title III,** Extremely Hazardous Substance	_____ yes	__X__ no
c) **Toxic Chemical Release Report**	__X__ yes	_____ no

Nickel & Manganese are subject to requirements of Section 313 of the Community Right-to-know Act of 1986 & 40CFR Part 372.

The information presented here has been compiled from sources considered to be reliable and accurate to the best of our knowledge and belief, but is not guaranteed to be so.

Material Safety Data Sheet

FOR INDUSTRIAL USE ONLY

BETACURE® 100

1. Product and company identification

Product name	BETACURE® 100
MSDS Number	000000106352
Product Type	Ester.
Product use	Catalyst - Phenolic Resin Applications
Manufacturer, Importer, Supplier	HA International, LLC 630 Oakmont Lane Westmont, IL 60559
Print date	14-FEB-2012
Telephone	**For Emergency Medical Assistance** Call Health & Safety Information Services, 1-866-303-6949 **For Emergency Transportation Information** CHEMTREC US Domestic (800) 424-9300 CHEMTREC International (703) 527-3887 CANUTEC CA Domestic (613) 996-6666 For additional health and safety or regulatory information, call (630)575-5722, or (630)575-5705.

2. Hazards identification

Form	Liquid
Odor	slight, pleasant
OSHA/HCS status	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. FLAMMABLE. MAY FORM EXPLOSIVE MIXTURES WITH AIR. VAPOR MAY CAUSE FLASH FIRE. MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. HARMFUL IN CONTACT WITH SKIN OR IF SWALLOWED. INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS AND NAUSEA AND MAY LEAD TO UNCONSCIOUSNESS. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

Potential acute health effects

Inhalation	Can cause central nervous system (CNS) depression. Irritating to respiratory system. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage.
Ingestion	Harmful if swallowed. Can cause central nervous system (CNS)

depression. May be fatal or cause blindness if swallowed.

Skin Harmful in contact with skin. Irritating to skin.

Eyes Irritating to eyes.

Potential chronic health effects

Chronic effects Contains material that can cause target organ damage.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects Contains material which may cause developmental abnormalities, based on animal data.

Fertility effects Contains material which may impair female fertility, based on animal data.

Target organs Causes damage to the following organs: blood system central nervous system (CNS), eyes, liver,

Over-exposure signs/symptoms

Inhalation Adverse symptoms may include the following: nausea or vomiting, respiratory tract irritation, coughing, headache, drowsiness/fatigue, dizziness/vertigo, visual disturbances, unconsciousness, coma

Ingestion Adverse symptoms may include the following: nausea or vomiting, dizziness/vertigo, drowsiness/fatigue, headache, unconsciousness, coma

Skin Adverse symptoms may include the following: irritation, redness, dryness cracking

Eyes Adverse symptoms may include the following: pain or irritation, watering, redness,

Medical conditions aggravated by over-exposure Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See section 11 for more detailed information on health effects and symptoms.

3. Composition/Information on ingredients

Ingredient name	CAS number	WT %
Methyl Formate	107-31-3	70.0 - 100.0
Methanol	67-56-1	1.0 - 5.0

** *Any applicable Canadian trade secret numbers will be listed in Section 15.*

4. First aid measures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.

Skin contact Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean

shoes thoroughly before reuse.

Inhalation

Get medical attention immediately. Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Ingestion

Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first aid personnel

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. If it is suspected that dust, vapor, mist or gas are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.

Notes to physician

Methyl formate is biologically transformed via hydrolysis to methanol and formic acid. Significant exposure through ingestion or inhalation may result in severe acidosis and nephropathy. Full information on the diagnosis and treatment of methanol poisoning is contained in the IPCS Poisons Information Monograph No. 335.
Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

See section 11 for more detailed information on health effects and symptoms.

5. Fire-fighting measures

Flammability of the product

Extremely flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Extinguishing media

Suitable

Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable

Do not use water jet.

Special exposure hazards

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Hazardous combustion products

Decomposition products may include the following materials: carbon oxides, .

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Special Remarks on Explosion Hazards	Liquid and vapor may cause a flash fire or ignite explosively. Vapor is heavier than air and may settle in low places or spread long distances to a source of ignition and flashback. Explosive atmospheres may linger. Closed containers can rupture and release toxic vapors or decomposition products.

6. Accidental release measures

Personal precautions	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Vapor has little odor. Do not depend upon odor to detect the presence of vapors. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8). Do not breathe dust, vapor, mist or gas.
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Large spill	Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.
Small spill	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

7. Handling and storage

Handling	Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Avoid exposure during pregnancy. Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during

transfer by grounding and bonding containers and equipment before transferring material. Follow US NFPA 30, "Flammable & Combustible Liquids Code", or other national, state and local codes on safe handling of flammable liquids. Train workers in the recognition and prevention of hazards associated with the storage, handling and transfer of flammable liquids in the plant. Empty containers retain product residue and can be hazardous. Do not reuse container. Do not breathe dust, vapor, mist or gas.

Storage

Store in an area designated for storage of flammable liquids (See NFPA 30 and OSHA 29 CFR 1910.106). Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Ingredient name	Occupational exposure limits
Methyl Formate	ACGIH TLV 8-hr TWA 246 mg/m3 100 ppm ACGIH TLV STEL (15 min) 368 mg/m3 150 ppm OSHA PEL 8-hr TWA 250 mg/m3 100 ppm
Methanol	ACGIH TLV 8-hr TWA 262 mg/m3 200 ppm ACGIH TLV STEL (15 mins) 328 mg/m3 250 ppm OSHA PEL 8-hr TWA 260 mg/m3 200 ppm

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before

	reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Respiratory	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Hands	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eyes	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Skin	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Form	Liquid
Flash point	-32 °C(-26 °F) Tag Closed Cup ASTM D 56
Auto-ignition temperature	440 °C
Flammable limits	
Lower:	5.0 %(V)
Upper:	23.0 %(V)
Color	Clear, colorless/colourless
Odor	slight, pleasant
pH	Not available
Boiling point	32.2 °C(90.0 °F)
Freezing Point	-100 °C(-148 °F)
Relative density	0.959 - 0.970
Vapor pressure	476 mm Hg @ 25 °C(77 °F)
Odor threshold	200 - 2,800 ppm
Viscosity	Dynamic: Not available
Solubility	33 %(V) @ 20 °C(68 °F)
Partition coefficient: n-octanol/water	Not available
Evaporation rate	100 (n-Butyl acetate=1)
Vapor density	2.1

10. Stability and reactivity

Stability	The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to

	heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas. Avoid exposure - obtain special instructions before use.
Materials to avoid	Highly reactive or incompatible with the following materials: oxidizing materials,
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological information

Acute toxicity

Ingredient name

Methyl Formate

LD50	Oral	Rat	475 mg/kg
LD50	Oral	Mouse	875 mg/kg
LD50	Oral	Rabbit	1,622 mg/kg
LC50	Inhalation	Rat	5.2 mg/l/4 h
LD50	Dermal	Rat	> 4,000 mg/kg
LD50	Dermal	Rabbit	> 5,000 mg/kg

Methanol

LDLo	Oral	Human	143 mg/kg
LDLo	Dermal	Monkey	393 mg/kg

Other Toxicological Information

Carcinogenicity

Classification

Ingredient name

Methyl Formate

ACGIH	Not classified
IARC	Not classified
NTP	Not listed
OSHA	Not regulated
EU	Not classified

Methanol

ACGIH	Not classified
IARC	Not classified
NTP	Not listed
OSHA	Not regulated
EU	Not classified

12. Ecological information

Environmental effects

Poses a significant risk of oxygen depletion in aquatic systems.

Aquatic ecotoxicity

Ingredient name

Methanol

Fresh water	Acute EC50 13,000 mg/l/4 d	Rainbow trout,donaldson trout	

Other adverse effects

No known significant effects or critical hazards.

13. Disposal considerations

Waste disposal	If this material becomes a waste, it would be an ignitable hazardous waste,

hazardous waste number D001 (40 CFR 261.21). Refer to latest EPA or state regulations regarding proper disposal. The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. Transport information

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

International transport regulations

Regulatory Information	UN/NA number	Proper shipping name	Classes/*PG	Reportable Quantity (RQ)
CFR	1243	METHYL FORMATE	Class 3 I	
TDG	1243	METHYL FORMATE	Class 3 I	
IMO/IMDG	1243	METHYL FORMATE	Class 3 I	
IATA (Cargo)	1243	METHYL FORMATE	Class 3 I	

*PG : Packing group

15. Regulatory information

US regulations

HCS Classification Flammable liquid, Irritating material, Target organ effects

U.S. Federal regulations SARA 311/312 Classification Immediate (acute) health hazard, Delayed (chronic) health hazard, Fire hazard

SARA 313 - Supplier Notification
This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.
Methanol - 67-56-1 (3.00%).

SARA 302 Extremely Hazardous Substances None required.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants The following components are listed: Methanol,

State regulations Massachusetts RTK Substances The following components are listed: Methyl Formate, Methanol,

New Jersey RTK Hazardous Substances The following components are listed: Methanol, Methyl Formate,

Pennsylvania RTK Hazardous Substances The following components are listed: Methanol, Methyl Formate,

California Prop. 65: None required.

Canada

WHMIS (Canada)
Class B-2: Flammable liquid
Class D-1B: Material causing immediate and serious toxic effects (Toxic).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists
Canadian NPRI: The following components are listed: Methanol,

International regulations

Chemical inventories
Europe inventory All components are listed or exempted.
Australia inventory (AICS) All components are listed or exempted.
China inventory (IECSC) All components are listed or exempted.
Japan inventory (ENCS) All components are listed or exempted.
Japan inventory (ISHL) Not determined.
Korea inventory (KECI) All components are listed or exempted.
New Zealand Inventory (NZIoC) Not determined.
Philippines inventory (PICCS) All components are listed or exempted.
United States inventory (TSCA 8b) All components are listed or exempted.
Canada inventory All components are listed or exempted.

16. Other information

Hazardous Material Information System III (U.S.A.)
Health : 2
Flammability: 4
Physical hazards : 0
Chronic : *

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.
The customer is responsible for determining the PPE code for this material.

Prepared by Product Safety & Compliance Group, (630)575-5722, or (630)575-5705
Date of issue 29-SEP-2010
Date of printing 14-FEB-2012
Version 3.0
Notice to reader
SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE, except that the product shall conform to contracted specifications, and that the product does not infringe any valid United States or Canadian patent. No claim of any kind shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

Hickman, Williams & Company

MATERIAL SAFETY DATA SHEET

We believe the following information is accurate. It is offered in good faith but without warranty - express or implied. Since conditions of use are beyond our control, all risks of use are assumed by the user. Nothing herein shall be construed as a recommendation for uses which infringe on valid patents.

IDENTITY (As Used on Label and List)	24351 4155	NOTE:
H.C. Ferrochrome Fines-All Sizes		Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name HICKMAN, WILLIAMS & CO.	Emergency Telephone Number (800) 424-9300
Address (Number, Street, City, State and Zip Code) 103 NORTH MEADOWS DR.	Telephone Number for Information (412) 787-7160
SUITE 234	Date Prepared 1/09/01 GFG
WEXFORD, PA 15090-0000	Signature of Preparer (optional)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))		OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
7440-47-3	Chromium	1.0 mg/m3	0.5 mg/m3	-	62% - 68%
9-89-6	Iron	10.5 mg/m3	5.0 mg/m3	-	Balance
7440-44-0	Carbon	10.0 mg/m3	15.0 mg/m3	-	6.0 - 8.0%
7440-21-3	Silicon	-	10.0 mg/m3	-	.3 - 2.0%

Section III - Physical/Chemical Characteristics

Boiling Point N/A	Specific Gravity (H2O=1) App 7.0
Vapor Pressure (mm Hg) N/A	Melting Point App 2700 F
Vapor Density (AIR=1) N/A	Evaporation Rate (Butyl Acetate=1) N/A

Solubility in Water
Insoluble

Appearance and Odor
Silver Metallic - odorless

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
N/A	N/A	N/A	N/A

Extinguishing Media
Not - Flammable

Special Fire Fighting Procedures
None

Unusual Fire and Explosion Hazards
None

Section V - Reactivity Data

Stability			Conditions to Avoid
	Unstable		None
	Stable	X	

Incompatibility (Material to Avoid)
Strong Acids

Hazardous Decomposition or Byproducts
Irritating fumes and/or gases

Hazardous Polymerization			Conditions to Avoid
	May Occur		None
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	Dust	Dust	Not Normal

Health Hazards (Acute and Chronic)
None

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	No	No	No

Signs and Symptoms of Exposure
Eyes-Mechanical Irritation; Skin-Abrasion/Irritation; Lungs-Respiratory Irritation.

Medical Conditions Generally Aggravated by Exposure
See Attached

Emergency and First Aid Procedures
Eyes-flush w/water; Skin-was w/soap & water; Lungs-remove fresh air. Consult Physician, if necessary.

Section VII - Precautions for Safe Handling and Use

Steps to be taken in Case Material is Released or Spilled
Normal Cleanup

Waste Disposal Method
Landfill - according to local regulations

Precautions to be taken in Handling and Storing
Do not mix wet material with molten metal.

Other Precautions
None

Section VIII - Control Measures

Respiratory Protection (Specify Type)
NIOSH recommended for nuisance dust

Ventilation	Local Exhaust	Special
	Recommended	None
	Mechanical (General)	Other
	N/R	None

Protective Gloves	Eye Protection
Recommended	Glasses w/shields

Other Protective Clothing or Equipment
None

Hygienic Practices
Normal

Hickman, Williams & Company

MATERIAL SAFETY DATA SHEET

We believe the following information is accurate. It is offered in good faith but without warranty - express or implied. Since conditions of use are beyond our control, all risks of use are assumed by the user. Nothing herein shall be construed as a recommendation for uses which infringe on valid patents.

IDENTITY (As Used on Label and List)	28415 / 4720	NOTE:
INCO F Nickel Shot		Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name	Emergency Telephone Number
INTERNATIONAL NICKEL, INC	(800) 424-9300
Address (Number, Street, City, State and Zip Code)	Telephone Number for Information
C/O CALIF. WAREHOUSE	(734) 462-1890
4455 FRUITLAND AVE.	Date Prepared: 4/12/00 GFG
LOS ANGELES CA 90058	Signature of Preparer (optional)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))		OSHA PEL	ACGIH TLV	Other Limits Recommended		% (optional)
7440-02-0	Nickel	1.0 mg/m3	1.0 mg/m3	-	Typ	92.0%
7^40-21-3	Silicon	10.0 mg/m3	10.0 mg/m3	-	Typ	5.0%
7439-89-6	Iron	10.5 mg/m3	5.0 mg/m3	-	Typ	1.7%
7440-44-0	Carbon	10.0 mg/m3	15.0 mg/m3	-	Typ	0.4%
7704-34-9	Sulfur	-	-	-	Typ	0.1%
N/A	Trace Elements	-	-	-	Typ	0.8%

Section III - Physical/Chemical Characteristics

Boiling Point	Specific Gravity (H2O=1)
2732 C	8.9
Vapor Pressure (mm Hg)	Melting Point
N/A	1453 C
Vapor Density (AIR=1)	Evaporation Rate (Butyl Acetate=1)
N/A	N/A

Solubility in Water
Insoluble

Appearance and Odor
Silver - Gray pellets - no odor

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
N/A	N/A	N/A	N/A

Extinguishing Media
. - Non-Flammable

Special Fire Fighting Procedures
None

Unusual Fire and Explosion Hazards
N/A

Section V - Reactivity Data

Stability			Conditions to Avoid
	Unstable		None
	Stable	X	

Incompatibility (Material to Avoid)
.ds

Hazardous Decomposition or Byproducts
None

Hazardous Polymerization			Conditions to Avoid
	May Occur		None
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	See Attached	See Attached	See Attached

Health Hazards (Acute and Chronic)
See Attached

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	Yes	See Attached	No

Signs and Symptoms of Exposure
See Attached

Medical Conditions
Generally Aggravated by Exposure
See Attached

Emergency and First Aid Procedures
See Attached

Section VII - Precautions for Safe Handling and Use

Steps to be taken in Case Material is Released or Spilled
Pickup and replace in original container

Waste Disposal Method
Return to Supplier or Landfill - according to local regulations

Precautions to be taken in Handling and Storing
Do not store near acids. Keep container closed

Other Precautions
None

Section VIII - Control Measures

Respiratory Protection (Specify Type)
See Attached

Ventilation	Local Exhaust	Special
	See Attached	None
	Mechanical (General)	Other
	None	None

Protective Gloves	Eye Protection
Recommended	Glasses w/shields

Other Protective Clothing or Equipment
None

Work/Hygienic Practices
None

MATERIAL SAFETY DATA SHEET

IFS EMERGENCY PHONE - (610) 378-1381
MANUFACTURER: INTERNATIONAL FOUNDRY SUPPLY, INC.
ADDRESS: 400 ORRTON AVE. P.O. BOX 1053
READING, PA 19603
PHONE (610)378-1381 FAX (610)378-5080

PRODUCT IDENTIFICATION
TRADE NAME: IFS PRIMALL 404
IFS PROD NO(S):106329, 106330, 106342, 106343

Prepared By: Safety Dept.
Date Prepared: 1/16/13 **Replaces Sheet Dated: 10/28/09**

SECTION 2: HAZARDOUS INGREDIENTS IDENTITY

Hazardous Component(s):	OSHA PEL	ACGIH TLV	CAS No.	%
Ethylene Glycol	Not Listed	50 ppm (vapor)	107-21-1	8-10%

SECTION 3: PHYSICAL AND CHEMICAL CHARACTERISTICS

1)Boiling Point: IBP 212°F 2)Specific Gravity: 1.0
3)Vapor Pressure: 20 @ 77°F 4) Vapor Density: >1
5)Solubility in Water: Infinite 6) Reactivity with Water: None
7)Appearance and Odor: Green, clean liquid, odor nil
8)Melting Point: N/A (liquid at room temperature)

SECTION 4: FIRE AND EXPLOSION DATA

1)Flash Point: None 2)Method Used:
3)Auto Ignition Temp: Not Determined
4)Extinguisher media: N/A
5)Flammable Limits / % Volume in Air:
Lower: N/A Upper: N/A
6)Special Fire Fighting Procedures: Do not enter confined fire space without SCBA
7)Unusual Fire and Explosion Hazards: None

SECTION 5: PHYSICAL/CHEMICAL HAZARDS (REACTIVITY DATA)

1)Stability: Stable: [X] Unstable: [ ]
2)Conditions to Avoid:
3)Incompatibility (Materials to Avoid):Strong oxidizers, materials incompatible with water,i.e., sodium metal, calcium carbide, etc.
4)Hazardous Decomposition Products: Oxides of Carbon
5)Hazardous Polymerization: May occur: [ ] Will Not Occur: [X]

SECTION 6: HEALTH HAZARDS

1) Acute: Eye, nose, throat irritation, CNS depression
2) Chronic: None Listed
3)Signs and Symptoms of Exposure: Redness, pain, irritation of skin, eyes, nose, throat in small doses. Dizziness, malaise, nausea, vomiting, in large doses.
4)Medical conditions generally aggravated by Exposure: None Known
5)Chemicals Listed as Carcinogen or Potential Carcinogen:
National Toxicology Program: Yes [ ] No [X]
I.A.R.C. Monographs: Yes [ ] No [X] OSHA: Yes [ ] No [X]

SECTION 7:EMERGENCY AND FIRST AID PROCEDURES:

If Symptoms of Overexposure Develop, Always Seek Immediate Medical Attention.
ROUTES OF ENTRY:
1) Inhalation(Breathing): Move to fresh air.
2) Eye Contact: Flush with water.
3) Skin Contact: Wash with mild soap and water.
4) Ingestion (Swallowing):Induce vomiting if conscious. Drink large volume of water.

SECTION 8: SPECIAL PRECAUTIONS AND SPILL / LEAK PROCEDURES:

1)Precautions to be Taken in Handling and Storage: Keep material from freezing
2)Other Precautions: Material is extremely slippery. Absorb spills immediately.
3)Steps to be Taken in Case Material is Released or Spilled: Do not flush to sewer or ground. Absorb with earth, sand, sawdust. Shovel into container for disposal.
4)Waste Disposal Methods (Always Consult Federal, State, Regional, and Local Regulations Pertaining to This Material Before Using Any Method Suggested Here):
5)Consult Local Waste Disposal Professionals.

SECTION 9: SPECIAL PROTECTION INFORMATION / CONTROL MEASURES
General: Always Use Protective Equipment / Clothing as Necessary to Keep Exposure to This Material Below Applicable Exposure Limits.

1) Respiratory Protection (Specify Type): NIOSH approved for mists or vapors as required.
2) Ventilation: 2) Local Exhaust: AS Required
4) Mechanical (General): Special:
Other:
5) Protective Gloves: Rubber, Vinyl
6) Eye Protection: Chemical Splash Goggles
7) Other Protective Clothing or Equipment: Use protective equipment as required to keep exposure below TLV's.
8) Work / Hygienic Practices: Wash skin and clothing with soap and water after use.

MATERIAL SAFETY DATA SHEET

IFS EMERGENCY PHONE - (610) 378-1381
CHEMTREC - (800) 424-9300
MANUFACTURER: IFS INDUSTRIES, INC.
ADDRESS: 400 ORRTON AVE. P.O. BOX 1053
READING, PA 19603
PHONE (610)378-1381 FAX (610)378-5080

PRODUCT IDENTIFICATION

TRADE NAME: IFS #4 LIQUID PARTING

PRODUCT NOS. 106490, 106500,106520,106530

Prepared By: Safety Dept.
Date Prepared: 01/10/11 **Replaces Sheet Dated: 06/13/07**

SECTION 2: HAZARDOUS INGREDIENTS IDENTITY

Hazardous Component(s):	OSHA PEL	ACGIH TLV	OTHER LIMITS	CAS No.	% BY WT.
Mineral Oil	5 mg/m^3	5 mg/m^3	(oil mist)	64741-44-2	≥95

HMIS: HEALTH=0, FLAMMABILITY=1, REACTIVITY=0

SECTION 3: PHYSICAL AND CHEMICAL CHARACTERISTICS

1) Boiling Point: IBP 510° F
2) Specific Gravity: 0.83
3) Vapor Pressure: Nil
4) Vapor Density: Not Volatile
5) Solubility in Water: Negligible
6) Reactivity with Water: None
7) Appearance and Odor: Golden brown oil with characteristic odor
8) Melting Point: N/A

SECTION 4: FIRE AND EXPLOSION DATA

1) Flash Point: 275° F

2) Method Used: COC

3) Auto Ignition Temp: Not Determined

4) Extinguisher media: Carbon dioxide, dry chemical, foam, water fog

5) Flammable Limits / % Volume in Air:
Lower: Not Determined Upper: Not Determined

6) Special Fire Fighting Procedures: Do not use water except as fog

7) Unusual Fire and Explosion Hazards: None Known

SECTION 5: PHYSICAL/CHEMICAL HAZARDS (REACTIVITY DATA)

1) Stability: Stable: [X] Unstable: [ ]

2) Conditions to Avoid: None Known

3) Incompatibility (Materials to Avoid): Strong Oxidizers

4) Hazardous Decomposition Products: Carbon dioxide and carbon monoxide on burning.

5) Hazardous Polymerization: May occur: [ ] Will Not Occur: [X]

SECTION 6: HEALTH HAZARDS

1) Acute: Irritation

2) Chronic: Dermatitis

3) Signs and Symptoms of Exposure: Skin drying and dermatitis from extended skin contact.

4) Medical conditions generally aggravated by Exposure: None Known

5) Chemicals Listed as Carcinogen or Potential Carcinogen:
National Toxicology Program: Yes [ ] No [X]
I.A.R.C. Monographs: Yes [ ] No [X] OSHA: Yes [ ] No [X]

N/A = Not Applicable

SECTION 7: EMERGENCY AND FIRST AID PROCEDURES:

If Symptoms of Overexposure Develop, Always Seek Immediate Medical Attention.

ROUTES OF ENTRY:

1) Inhalation(Breathing): Move to fresh air.

2) Eye Contact: Flush with water for 15 minutes.

3) Skin Contact: Wash with soap and water.

4) Ingestion (Swallowing): DO NOT INDUCE VOMITING.

SECTION 8: SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES:

1) Precautions to be Taken in Handling and Storage: Keep away from heat.

2) Other Precautions: Keep away from heat, open flames and strong oxidizers.

3) Steps to be Taken in Case Material is Released or Spilled: Absorb with sand, earth, sawdust. Keep out of sewers and watercourses.

4) Waste Disposal Methods (Always Consult Federal, State, Regional, and Local Regulations Pertaining to This Material Before Using Any Method Suggested Here): Contains mineral oil.

5) Consult Local Waste Disposal Professionals.

SECTION 9: SPECIAL PROTECTION INFORMATION / CONTROL MEASURES

General: Always Use Protective Equipment / Clothing as Necessary to Keep Exposure to This Material Below Applicable Exposure Limits.

1) Respiratory Protection (Specify Type): NIOSH approved for mineral oil mist if exposure exceeds OSHA or ACGIH levels.

2) Ventilation: Recommended 3) Local Exhaust: Recommended

4) Mechanical(General): Special:
Other: KEEP CONCENTRATIONS BELOW OSHA & ACGIH LIMITS

5) Protective Gloves: Rubber, Vinyl

6) Eye Protection: Goggles, Face Shield

7) Other Protective Clothing or Equipment: As Required

8) Work / Hygienic Practices: Wash with soap and water after use.

Dept. 702

November, 1985
Revised: January, 1992

CASTING

8

MATERIAL SAFETY DATA SHEET

MANUFACTURER: INDUSTRIAL CHEMICAL PRODUCTS DIVISION
7 Greenwood Place
Pikesville, Maryland 21208

EMERGENCY TELEPHONE: (410) 484-5865
TRANSPORTATION EMERGENCY: 1-800-424-9300

SECTION I PRODUCT IDENTIFICATION

Tradename: ICP Warm Box Binder 905
Chemical Name and Synonyms: Modified Furfuryl Alcohol Resin
Chemical Family: Furfuryl Alcohol Resin
Formula: Mixture
CAS Number: None (See Section II)
DOT Proper Shipping Name: Resin Solution
DOT Hazard Class: Combustible Liquid
Identification Number: UN 2868
IMDG Class:

SECTION II HAZARDOUS INGREDIENTS

	%	TLV UNITS
Furfuryl Alcohol (CAS #: 98-00-0)	Greater Than 60%	10 ppm
Urea (CAS #: 57-13-6)		15 mg/m^3 Nuisance Dust
Polyolny/Acetate (CAS #: 9003-20-7)	Less Than 8%	None Known
Phenolic Novolak (CAS #: 9003-35-4)	Less Than 20%	None Known
SARA TITLE III SECTION 313 REPORTABLE CHEMICALS		**OSHA-PEL**
Methanol (CAS #: 67-56-1)	Less Than 1%	200 ppm STEL 250 ppm
Formaldehyde (CAS #: 50-00-0)	Less Than 2%	1 ppm
Phenol (CAS#: 143-74-8)	Less Than .5%	1 ppm

SECTION III PHYSICAL DATA

Boiling Point: Not Available
Vapor Pressure: Not Available
Vapor Density: Not Available
Solubility in Water: Partially Soluable
Specific Gravity (Water=1) @ 25°C: 1.16± 0.05
Percent Volatile: Not Available
Evaporation Rate: Not Available
Appearance: Amber Liquid
Odor: Slight

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point: 168°F (76°C) (Pensky-Martens)
Flammable Limits: Not Available
Extinguishing Media: Water fog, foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate area. Wear positive pressure breathing apparatus and full protective clothing. Dike fire control water for later disposal.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Solid streams of water may be ineffective in fire fighting; use flooding quantities as fog. Containers may explode in heat of fire; cool with water. Vapors are heavier than air and may travel along ground; use water spray to reduce vapors. Contact with strong acids can cause violent exothermic polymerization.

SECTION V HEALTH HAZARD DATA

Threshold Limit Value: Not determined for resin.

Furfuryl Alcohol:	OSHA-PEL 50 ppm (skin) by volume in air (200 mg/m^3) TWA.
	ACGIH-TLV 10 ppm (skin) by volume in air (40 mg/m^3) TWA.
Formaldehyde:	OSHA-PEL 1 ppm (1.5 mg/m^3) by volume in air TWA. AVC 5
	ACGIH-TLV 1 ppm (1.5 mg/m^3) by volume in air TWA.

CARCINOGENICITY: The numerous epidemiological studies have failed to demonstrate a relationship between formaldehyde exposure and nasal cancer, or pulmonary diseases such as emphysema or lung cancer. Human experience has not indicated short-term effects other than irritantcy, at mean levels of exposure of 1 ppm or below. (Farber, Goldberg & Munro, REPORT OF A PANEL, REVIEW OF AVAILABLE INFORMATION ON THE HEALTH EFFECTS OF OCCUPATIONAL EXPOSURE TO FORMALDEHYDE, Ontario Ministry of Labour, 1/85).

SECTION V HEALTH HAZARD DATA (CONT'D)

EFFECTS OF OVEREXPOSURE:

Routes of entry: Eye & skin contact, inhalation, ingestion.

EYE: Redness, tearing, serious irritation, inflammation, corneal opacity.

SKIN: Absorbed through skin. Irritation, dryness, defatting, dermatitis.

INHALATION: Nasal and respiratory irritation, dizziness, nausea, headache, drowsiness.

INGESTION: Nausea, vomiting, salivation, diarrhea, respiratory distress, lowered body temperature.

EMERGENCY AND FIRST AID PROCEDURES:

EYE: Immediately flush with large amounts of water for 15 minutes, occasionally lifting upper and lower lids. Get immediate medical attention.

SKIN: Wash with soap and water. If soaked through clothing, remove clothing and wash skin. Launder clothing before reuse. Discard saturated shoes.

INHALATION: Remove to fresh air. If breathing difficult, give oxygen. If breathing stops, give artificial respiration. Keep victim warm and at rest. Get immediate medical attention.

INGESTION: Immediately give large amounts of water. Induce vomiting by tickling back of throat. Do not give an unconscious person anything by mouth or attempt to induce vomiting. Get immediate medical attention.

SECTION VI REACTIVITY DATA

Stability: Stable

Materials to Avoid (Incompatibility): Acids, foundry catalysts & strong oxidizers.

Hazardous Decomposition Products: Combustion produces carbon dioxide and possibly carbon monoxide.

SECTION VI REACTIVITY DATA (CONT'D)

Hazardous Polymerization: May occur.
Conditions to Avoid: Improper contact with acids and foundry catalysts. DO NOT MIX DIRECTLY WITH FOUNDRY CATALYST. Binder or catalyst must first be distributed on sand.

SECTION VII SPILL OR LEAK PROCEDURES

SMALL SPILL: Absorb with non-combustible, granular material (e.g. sand). Remove by mechanical means and place material in metal container temporarily for later disposal.

LARGE SPILL: Stop leak if possible without risk. Turn off ignition sources. Evacuate area. Wear self-contained breathing apparatus and full protective clothing during clean-up. Dike spill and pump into salvage tank. Absorb remaining liquid with sand or other non-combustible, granular material. Remove by mechanical means.

WASTE DISPOSAL: Remove excess material. Wash floor with water or alkaline cleaning solution (do not use acidic cleaning materials). Dispose of all waste material in strict accord with local, state and federal (RCRA) regulations. Can be incinerated if in accord with regulations or sent to hazardous material disposal facility.

SECTION VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection: None usually required with adequate ventilation. Use NIOSH approved respirator if airborne levels exceed PEL and in emergency situations (fire or large spill).

Ventilation: Provide adequate ventilation. Maintain good fresh air supply. Spark-proof fans not required.

Eye Protection: Wear chemical goggles or face sheild.

Other Protective Equipment: Eye fountain and safety shower.

TION IX SPECIAL PRECAUTIONS

Handling: No smoking or eating in handling area. Penetrates intact skin; wash hands after handling.

Storage: Store in tightly closed steel containers in cool, ventilated area away from open flame, acids, foundry catalysts, and strong oxidizers. Equip storage tanks with flash arrestor in case of fire nearby. Storage tanks should be diked with provision for pumping large spills to a salvage tank.

01-02-92	Thomas C Patter	Prod. Mgr.
DATE	AUTHORIZED SIGNATURE	TITLE

The data contained herein are based on information currently available to us and believed to be factual and the opinions expressed to be those of qualified experts; however, these data are not to be taken as a warranty or representation for which INDUSTRIAL CHEMICAL PRODUCTS DIVISION assumes legal responsibility.

MATERIAL SAFETY DATA SHEET

98

Company Name: Nathan Trotter & Co., Inc.
Company Address: PO Box 1066, 316 Commerce Dr.
Exton, PA 19341
Emergency Telephone No.: 610-524-1440 / 610-964-8415

Product Name: COPPER (Cu)
Synonyms:

HAZARDOUS INGREDIENTS

Definite Ingredient	Suspect Ingredient	Ingredient	Nominal %
		Aluminum	
		Antimony	
		Arsenic	
		Beryllium	
		Bismuth	
		Boron	
		Cadmium	
		Carbon	
		Chromium	
		Cobalt	
		Columbium	
X		Copper	99.9
		Iron	
		Lead	
		Magnesium	
		Manganese	
		Molybdenum	
		Nickel	
		Phosphorus	
		Silicon	
		Sulfur	
		Tantalum	
		Tin	
		Titanium	
		Tungsten	
		Zinc	

If there are checks next to the ingredients, those ingredients are believed to be definitely included or are suspected to be included in the metal. See the attached information for each element.

If there is no check next to an ingredient, that ingredient is not believed to be included in metal.

(over)

SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposures within allowable limits during melting and pouring operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH-approved respirators should be used and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate personal protective equipment for the eyes should be worn during all melting and pouring operations.

PROTECTIVE GLOVES: As needed to protect against physical hazards.

GENERAL: Care should be taken when melting and handling molten metal since copper alloys temperatures generally exceed 2000° F. Severe metal burns could occur.

PHYSIOLOGICAL EFFECTS

Primary Route of Exposure: Inhalation of fumes from melting or pouring.

Acute Effects: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever." Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms) which come on a few hours after large exposures. Long-term effects of metal fume fever have not noted.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: If acute overexposure to fumes occurs, remove victim from the adverse environment and seek medical attention.

SKIN CONTACT: If dust or mist gets on the skin, wash the contaminated skin with soap and water. Remove contaminated clothing and launder before using again.

EYE CONTACT: Flush with large amounts of water.

INGESTION: If particles are ingested, give 1-2 glasses of water or milk. Induce vomiting only if victim is fully conscious and has not convulsed. All ingestion cases should have immediate medical aid.

SPILL OR LEAK PROCEDURES

Minimal problems with spills of this product would occur because of its solid form. However, if there is a spill of dust, clean up using methods which avoid dust generation and the use of water, such as vacuum. If airborne dust is generated during the clean-up, use an appropriate NIOSH-approved respirator.

Waste Disposal Method: Dispose of in accordance with appropriate federal, state and local regulations.

CARCINOGENIC ASSESSMENT

See appropriate attachment.

(Continued)

FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A Flammable Limits: N/A

Metal products are not a fire hazard. Water should not be poured on fires involving molten metal.

Extinguishing Media: Special mixtures of dry chemical suitable for metal fires.

REACTIVITY DATA

See Appropriate attachment.

ADDITIONAL COMMENTS

The metal itself presents no health hazard until it is melted. During these procedures, it is possible that excessive amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

In case of emergency, please call: Russ Etherington

Company: Nathan Trotter & Co., Inc. Telephone No.: 610-524-1440

Issue Date: 5/30/00 Supersedes: 610-964-8415

This information is taken from sources believed to be reliable; however, Nathan Trotter Company makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

R.H. Sheppard Co., Inc.
101 Philadelphia St.
Hanover, PA 17331
Attn: Peter Sheppard, President

5SEP 11:40AM

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X L. Moffitt ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☒ Certified Mail® ☐ Priority Mail Express™
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ Collect on Delivery

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Transfer from service label)* 7013 1090 0002 2838 0253

PS Form 3811, July 2013 Domestic Return Receipt

UNITED STATES POSTAL SERVICE

PA 171
02 SEP '14
PM 2 L

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

• Sender: Please print your name, address, and ZIP+4® in this box•

Bonnie Hriczko
U.S. Environmental Protection Agency
Removal Action Branch-(MS-211)
Building 205
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679

867999

ORIGIN ID:ODMA (410) 579-5040
MAILROOM
SEMMES BOWEN & SEMMES
25 S CHARLES ST STE1400

BALTIMORE, MD 21201
UNITED STATES US

SHIP DATE: 220CT14
ACTWGT: 1.2 LB
CAD: 105956503/WSXI2600

BILL SENDER

TO MS BONNIE HRICZKO
US ENVIRONMENTAL PROTECTION AGENCY
REGION II - REMOVAL ACTION BRANCH
2890 WOODBRIDGE AVE MS-211
EDISON NJ 08837

(410) 539-5040 REF:
INV:
PO: DEPT:

522G1/DF64/8AC9

FedEx Express

J142214092301uv

TRK# 0201 7715 9004 9450

THU - 23 OCT 10:30A
PRIORITY OVERNIGHT

E2 LDJA

08837
NJ-US EWR